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# MICHIGAN OUTLOOK

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Government statisticians first recognized automobile manufacturing as a distinct industry in the Census of Manufacturers for 1905. There it is recorded that 9,023 of the 20,261 motor vehicles made in the United States rolled out of Michigan factories during 1904. In 1914, Michigan produced 443,072 cars, trucks, and buses out of a national total of 569,054. Production here and nationally continued to grow unevenly until 1929. Michigan was a leader out of the Great Depression, setting new vehicle production records by 1935.

To satisfy burgeoning demand for Michigan-made cars and trucks, employers recruited laborers from rural Michigan and from Ohio, Kentucky, Tennessee, and other eastern states, as well as from Canada, Ireland, England, France, Poland, and other European countries. The news of high wages in Detroit, Flint, Saginaw, Muskegon, and other automotive centers also reached Mexico, the Middle East, and more distant lands. As a result, although 3 percent of the U.S. population resided in Michigan in 1910, by 1920 the figure was 3.5 percent, in 1930, 3.9 percent, and in 1940, 4 percent.

During World War II, Southerners flocked to Michigan, the "Arsenal of Democracy." After the war, pent-up vehicle demand spurred Michigan's economy until the late 1940s. The Korean War was the stimulus during the early 1950s. In 1950, 4.2 percent of the nation's inhabitants lived in Michigan. The peak, 4.4 percent, was reached in 1956.

With the 1956 model year, manufacturers began to retrench because of a saturated vehicle market. The level of employment in this state declined by 300,000 between 1955 and 1961. The proportion of the population residing here slipped every year betwen 1956 and 1963.

Few experts in 1961 sensed the magnitude of demand for large passenger cars, station wagons, and pick-up trucks for personal use and that Michigan would experience another mighty economic boom. Between 1961 and 1965, Michigan vehicle production doubled. In a replay of the 1930s, from being among the most depressed, Michigan became one of the most labor scarce states, again recruiting Southern workers.

A 1964 treaty between Canada and the U.S. allowed vehicle makers to ignore trade barriers between the two countries. In the subsequent rationalization, Ontario and Quebec became more specialized in the assembly of vehicles, while Michigan and Ohio increased their concentration in component production. Michigan also increased its

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share of North American automotive research and development and of automotive white collar activity in general.

## A HIGH WAGE STATE

General Motors, Ford, and Chrysler pay well, particularly for relatively low-skilled workers. They set the tone in labor markets like Detroit, Flint, Saginaw, Lansing, and Ann Arbor, where they employ thousands.

Transitory demand for cars, trucks, and buses also affects the size of the paycheck; when vehicle sales are high, blue-collar workers can expect to work overtime. This phenomenon occurs because, by law, most employees who work more than 40 hours per week must be paid a wage at least 50 percent above their standard rate. Rather than hire and train workers, employers will pay the overtime premiums to meet short-run requirements. This gives them the flexibility of simply extending the length of the workshift, as well as avoiding fixed labor costs, such as training and certain fringe benefits. If an increase in demand seems long lasting, vehicle manufacturers and their suppliers recall those on lay-off and hire new workers, expecting to be able to recoup fixed labor expenses while reducing the cost of overtime.

Because of generally high wages, health care, cosmetology, dry cleaning, laundering, and other locally provided services are more expensive in Detroit, Flint, Saginaw, Lansing, and Ann Arbor than they are in Houston, Mobile, or, for that matter, Grand Rapids. The pay level makes local government more expensive in vehicle manufacturing centers. State of Michigan civil servants and elected officials are well paid for much the same reason.

For the downside of the automotive cycle, Michigan has developed a relatively liberal unemployment insurance scheme and social welfare system. Many employers pay supplemental unemployment benefits. These programs are necessary if Michigan is to hold a labor reserve for recoveries. Their effect is to make Michigan an affluent state even during depressed years. In 1980, for example, Michiganders had incomes that were, on the average, 4.5 percent above the national figure, despite the fact that unemployment here stood at 12.6 percent of the civilian labor force compared with 7.1 percent for the U.S. as a whole.

## SI QUAERIS PENINSULAM AMOENAM

The Wolverine State has over 3,000 miles of Great Lakes shoreline, 36,000 miles of river and stream, and 11,000 natural lakes. Fifty-five areas are devoted to downhill skiing, countless others to the cross-country variety and to snowmobiling. Nearly 20 percent of Michigan's land area is government owned. Huron, Manistee, Hiawatha, and Ottawa national forests occupy 2.7 million acres of northern Michigan. Keweenaw, Alger, Leelanau and Benzie counties host Isle Royale National Park, Pictured Rocks National Lakeshore, and Sleeping Bear Dunes National Lakeshore.

The restaurants, motels, and shops on Mackinac Island and in St. Ignace provide the economic lifeblood of Mackinac County, as well as summer jobs for college students throughout the state. Big Bay, Grand Marais, and Paradise would collapse without tourism. Petoskey, Old Mission, and Baldwin owe much of their prosperity to summer residents. Convention and tourist dollars are a substantial component of Traverse City's economy.

Agriculture is perhaps more diverse here than in any other state. We lead in tart cherry, navy beans, and asparagus production. Michigan is a leader in producing apples, blueberries, grapes, sugar beets, and pickling cucumbers. These crops and the industries that process them are vital to a number of small Michigan economies.

Agriculture also is an essential complement to Michigan tourism. Nationally known events such as the Holland Tulip Festival and Traverse City's National Cherry Festival attract thousands of Michigan residents and visitors from elsewhere. Tourists also are drawn to the wineries in the Paw Paw vicinity and to county fairs.

Good quality higher education is affordable by many households. Traditionally, both natives and newcomers who prospered by working at high paying factory jobs have supported higher education, because it can provide their children with the means to a better life. However, even in the best of economic times, Michigan's economy will not absorb all of its college graduates. Therefore, Michigan is a net exporter of college-trained young people.

## OTHER EXPORTS

Of the dozens of Upper Peninsula iron mines developed since 1853, three remain economically viable: the open pit Republic, Tilden, and Empire mines, all located in Marquette County. The Cleveland-Cliffs Iron Company (CCI), largest private employer in Michigan's Upper Peninsula (UP), provides 4,000 white- and blue-collar jobs at full production. It is the nucleus of partnerships that own these excavations and the nearby plants where pellets are produced for steel mills in Detroit, Chicago, Sault Ste. Marie (Ontario), and other places accessible by Great Lakes ore carriers. The Empire Mine seems to be in transition. It is owned by McLouth Steel Corporation, a bankrupt Detroit area supplier to the automotive industry, and International Harvester Corporation, a troubled, Chicago-based motor vehicle and farm equipment manufacturer, along with Inland Steel and CCI. The full extent of CCI's dependence on the automotive industry is not known.

Until the mid-1970s, Ontonagon County, like Marquette and Chippewa counties, was sensitive to developments in the market for motor vehicles. Using copper from the last UP mine, owned by Copper Range Company, McCord Corporation of Detroit fashioned radiator fins for Ford and Chrysler products. Today this copper fabricator restricts its radiator market to J. I. Case, John Deere, and other farm equipment makers.

During the mid-nineteenth century, a number of English, Dutch, and Swedish wood craftsmen settled in the Grand Rapids area. The Grand River furnished water power and transportation, and a tremendous variety of trees provided the raw material that made Grand Rapids the furniture capital of America. Today the tradition lives on, although the focus has shifted from wooden household furniture to metal office systems. Steelcase, American Seating, Herman Miller, and other major producers are headquartered and conduct most of their manufacturing activity in the Grand Rapids-Zeeland area.

Whirlpool Corporation, known for its large home appliances as well as Sears, Roebuck and Company's principal supplier under the Kenmore label, is headquartered in Benton Harbor. White Consolidated makes refrigerators and freezers in Greenville, Belding, and Grand Rapids. There are other smaller, appliance makers and components suppliers in Greenville, Grand Rapids, Cadillac, Niles, Dowagiac, Mt. Pleasant, Kalamazoo, Adrian, Tecumseh, Livonia, Madison Heights, and Detroit.

Underground brine is the basis for chemical industries in Detroit, Muskegon, Ludington, and Manistee, as well as Midland, headquarters of Dow Chemical Corporation. Gypsum is mined in Grand Rapids and Alabaster, and salt in Detroit, Manistee, and Port Huron. Cement is made in Monroe, Wayne, Alpena, and Charlevoix counties.

Known primarily for its paper industry, Kalamazoo also hosts the Upjohn Company, a giant among pharmaceutical manufacturers. Park-Davis, Searle, and other drug manufacturers also have Michigan plants.

Kellogg Company, maker of breakfast foods, dominates the Battle Creek economy with its headquarters and plants. General Foods and Ralston Purina also make cereals there. Gerber Foods is headquartered in Fremont, Vlasic Foods in West Bloomfield, and Velvet Food Products in Livonia.

Amway, Burroughs, Chef Pierre, Franks Nurseries, Hudson's, Jacobson's, Kmart, Meijers, and Stroh Brewery are among the wide range of other nonautomotive companies headquartered in this state.

## EVENTS SINCE 1978

The first oil shock came in the fall of 1973. As a result of the Arab embargo, spot shortages occurred, and the price of petroleum shot up. The market for gas guzzling vehicles dwindled in 1974 and 1975 then recovered as oil prices stabilized at the new, higher level. From about 3 million in 1975, Michigan vehicle production recovered to a level of nearly 4 million during 1978. OPEC prices had resumed their rapid escalation even before April 1979 when long lines of cars formed at gasoline service stations in California. During the next two years pump prices doubled.

For Detroit, the other most significant event of 1979 was the new labor contracts between management and the United Automobile Workers. Anticipating a favorable 1980 model year, management bought labor peace. Bargainers failed to foresee that the high rate of price inflation, caused by escalating oil prices, and rapid increases in automotive wages, caused primarily by the cost of living adjustment, were to substantially widen the price gap between U.S. and Japanese vehicles.

A combination of inflation and actions by the Federal Reserve Board also raised interest rates by about 50 percent on the average betwen 1978 and 1981. These increases added to the cost of financing vehicle purchases, both at the dealer and final consumer level.

During 1978, 12.9 million cars, trucks, and buses were produced in this country. The 1980 figure was 8 million. During 1978, 2.3 million import vehicles were registered in this country. The 1980 figure was 3 million, most of them Japanese.

Overlaying this general malaise was the collapse of the Chrysler Corporation, a company which for two decades had allowed its U.S. operations to decay while obsessed with becoming a global producer. Plagued with production and quality problems, Chrysler was deeply troubled even before the 1979 hiatus. As a result of plant closings and other curtailments, Chrysler employment in Michigan alone dropped from 82,000 to 37,000 between the last quarter of 1978 and the first quarter of 1981. Their market more than halved, Chrysler suppliers cut their Michigan employment in proportionate numbers.

Between 700,000 and 750,000 Michigan white- and blue-collar jobs in manufacturing could be attributed to the production of cars, trucks, buses, and components during the fourth quarter of 1978.[1] In the eight-county southeast Michigan region there were 470,000 to 500,000 jobs, in northern Michigan, 15,000 to 20,000, and in southern outstate Michigan, 215,000 to 230,000. In February 1981 the number of jobs connected with making motor vehicles and components stood between 500,000 and 550,000.

Price rebates, declining interest rates, and an improved general economic outlook were responsible for modest sales gains of domestic makes early last year. This, along with production cuts during January, February, and March, reduced the backlog of unsold cars. But by fall 1981, price hikes on the new models coupled with a fresh spiraling of interest rates had halted the recovery. The inventory sales ratio for cars doubled between March and October.

Today, there are 525,000 automotive jobs in Michigan. Since 1978, the percentage decline in automotive and parts manufacturing employment has been greatest in northern Michigan (about 40 percent), next greatest in southeast Michigan (30 percent), and least in southern outstate Michigan (20 percent).

Tight money and high interest rates have had an even greater impact on housing and related industries than on the automotive sector. Nationally, the number of new housing units authorized totaled 975,000 during 1981, compared with 1,800,000 in 1978. The Michigan figures were 17,400 and 64,020. Fortunately, nonresidential construction is less depressed than residential; consequently construction employment declined by about one quarter from its 1978 level.

Michigan's wholesale trade, retail trade, government, finance, insurance, and real estate sectors also were geared to automotive production that numbered 700,000

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# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 41.1 | 40.1 | 39.8 (Mar.) |
| Average weekly hours, U.S. | 39.9 | 39.2 | 39.1 (Mar.) |
| Average hourly earnings, Michigan ($) | 10.27 | 11.03 | 11.16 (Mar.) |
| Average hourly earnings, U.S. ($) | 7.80 | 8.33 | 8.37 (Mar.) |
| U.S. motor vehicle production (units) | 786,862 | 468,467 | 664,116 (Mar.) |
| Michigan electricity usage (mil. kwh.) | 5,714 | 5,524 | 5,369 (Nov.) |
| Industrial (mil. kwh.) | 2,645 | 2,495 | 2,444 (Nov.) |
| Residential (mil. kwh.) | 1,745 | 1,674 | 1,634 (Nov.) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 770 | 590 | 500 (Jan.) |
| United States (000 net tons) | 10,590 | 7,962 | 7,737 (Jan.) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 268.3 | 277.9 | 278.2 (Mar.) |
| United States | 265.1 | 283.4 | 283.1 (Mar.) |
| U.S. producer price index (1967 = 100) | 289.6 | 298.5 | 297.9 (Mar.) |
| Michigan farm prices received index (1977 = 100) | 127 | 134 | 135 (Feb.) |

Sources: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

or more. They too were part of the downsizing of the Wolverine State economy between 1978 and 1981. Only the broad services sector grew, but at a much reduced rate by historical standards.

## AROUND THE STATE

Atlanta, Michigan, population 800, has been among this state's most devastated places as a result of the automotive decline (see table 1). A component plant there intermittently employed 300, mostly women, and paid slightly better than the $3.35 minimum wage. This plant, which assembled automotive wiring systems for Chrysler plants in Detroit, closed its doors in June 1980.

Standish was similarly affected, losing a wiring systems plant that supplied both Ford and Chrysler. Mancelona, Manistee, and Charlevoix have several small automotive suppliers whose activities have been curtailed. Reduced chemical production also cut employment in Manistee.

The severity of the downturn in Marquette is somewhat illusory in that 1978 was the peak year for construction activity at the Cleveland Cliffs Iron Company. CCI expanded its mining and ore processing facilities and increased the capacity of its electricity generating plant. With construction taken out of the data, there was an employment decline of around 12 percent instead of the 17 percent with construction workers included.

Newberry has felt the devastation more indirectly. To meet a burgeoning welfare budget, the state has skimped on several other programs. Activities at the Newberry Regional Mental Health Center have been sharply curtailed.

Of Michigan's sixty-three labor markets, nine are more distressed than the six-county Detroit region. None is a major metropolitan area. Nearly all are heavily dependent on the automotive industry as suppliers of components or minerals for steel making. The Detroit labor market has been more heavily affected than any other major metropolitan area in the state.

Among all Michigan labor markets, only eight posted gains between 1978 and 1981. The largest relative gain, in Ontonagon, represents a partial recovery from the 1975–78 cut-back that resulted from a sharp drop in copper production. The 20 percent job gain since 1978 is based upon a turnaround at the White Pine Mine plus a new industry, the Upper Peninsula Shipbuilding Company. UPSCO is producing barges designed to carry freight across Lake Michigan when the car ferries are retired. Baldwin has a tiny economy whose tourism and government sectors have made gains since 1978. The Escanaba gain is illusory; it consists primarily of construction workers who will depart when the new addition to the Mead Paper Mill is completed this fall. Greenville is benefiting from increased production of refrigerators and air conditioners. When General Motors sold Frigidaire to White Consolidated in order to change to production of small trucks in Dayton, Ohio, the Frigidaire equipment was moved to Greenville. Reed City, Fremont, and Mt. Pleasant have growing service and retail sectors. Three Rivers and Constantine, in the Sturgis area, are home to two new General Motors Hydramatic plants.

## TABLE 1

### Percentage Change in the Number of Wage and Salary Jobs in Michigan Labor Markets: Peak Years Through 1981 (Based on annual averages)

| Market | Peak to Trough Years | Percentage Change | Market | Peak to Trough Years | Percentage Change | Market | Peak to Trough Years | Percentage Change |
|---|---|---|---|---|---|---|---|---|
| Atlanta | 1978-81 | −30 | Battle Creek | 1978-81 | − 7 | Big Rapids | 1980-81 | − 2 |
| Standish | 1977-81 | −22 | Clare | 1979-80 | − 7[a] | Manistique | 1980-81 | − 2 |
| Coldwater | 1978-81 | −18 | West Branch | 1979-80 | − 6[a] | Alpena | 1980-81 | − 2 |
| Marquette | 1978-81 | −17 | Flint | 1979-81 | − 6 | Ironwood | 1980-81 | − 2 |
| Newberry | 1979-81 | −17 | Ludington | 1979-81 | − 6 | Cheboygan | 1980-81 | − 2 |
| Dowagiac | 1978-80 | −16[a] | Munising | 1980-81 | − 6 | East Tawas | 1979-81 | − 2 |
| Mancelona | 1979-81 | −11 | Cadillac | 1979-81 | − 5 | Roscommon | 1980-81 | − 1 |
| Manistee | 1979-81 | −10 | Hillsdale | 1979-80 | − 5[a] | Traverse City | 1980-81 | − 1 |
| Charlevoix | 1979-81 | −10 | Gaylord | 1979-81 | − 5 | St. Ignace | 1980-81 | − 1 |
| Detroit | 1978-81 | − 9 | Grayling | 1977-80 | − 5[c] | Rogers City | 1980-81 | − 1 |
| Mio | 1979-81 | − 9 | Muskegon | 1979-81 | − 4 | Kalamazoo | 1979-81 | − 1 |
| Adrin | 1979-81 | − 9 | Ann Arbor | 1979-81 | − 4 | Grand Rapids | 1979-81 | − 1 |
| Frankfort | 1979-81 | − 9 | Houghton | 1980-81 | − 4 | Lansing | 1979-81 | − 1 |
| L'Anse | 1978-81 | − 9 | Allegan | 1979-81 | − 4 | Mt. Pleasant | 1978-81 | + 3 |
| Caro | 1979-81 | − 9 | Sandusky | 1978-80 | − 4[a] | Sturgis | 1978-81 | + 4 |
| Benton Harbor | 1978-81 | − 8[b] | Iron River | 1978-81 | − 4 | Fremont | 1978-81 | + 5 |
| Sault Ste. Marie | 1977-80 | − 8[a] | Bay City | 1979-81 | − 3 | Reed City | 1978-81 | + 7 |
| Bad Axe | 1979-81 | − 8 | Alma | 1977-80 | − 3[d] | Greenville | 1978-81 | + 8 |
| Jackson | 1979-81 | − 8 | Menominee | 1979-80 | − 3[a] | Escanaba | 1978-81 | +12 |
| Iron Mountain | 1980-81 | − 7 | Midland | 1979-81 | − 3 | Baldwin | 1978-81 | +19 |
| Saginaw | 1979-81 | − 7 | Petoskey | 1979-81 | − 2 | Ontonagon | 1978-81 | +20[e] |

SOURCE: Developed from Michigan Employment Security Commission, special release.

a. Job gains occurred between 1980 and 1981. The rates of increase are Dowagiac, 2 percent; West Branch, 1 percent; Hillsdale, 2 percent; Sandusky, 2 percent; and Menominee, 1 percent.

b. Between 1973 and 1981 the number of jobs in Benton Harbor declined by 10 percent.

c. Between 1974 and 1980, the number of jobs in Grayling declined by 6 percent. Between 1980 and 1981 the number of jobs in Grayling increased by 5 percent.

d. Between 1973 and 1980, the number of jobs in Alma declined by 3 percent. Between 1980 and 1981, the number of jobs in Alma increased by 2 percent.

e. Between 1975 and 1978, the number of jobs in Ontonagon declined by 30 percent.

Note: Michigan's 83 counties are grouped into the 63 labor markets shown above except that Monroe County is part of the Toledo labor market (not shown). Multicounty labor markets are Battle Creek (Barry and Calhoun counties), Cadillac (Missaukee and Wexford counties), Detroit (Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties), East Tawas (Alcona and Iosco counties), Flint (Genesee and Shiawassee counties), Grand Rapids (Kent and Ottawa counties), Houghton (Houghton and Keweenaw counties), Kalamazoo (Kalamazoo and Van Buren counties), Lansing (Clinton, Eaton, Ingham, and Ionia counties), Muskegon (Muskegon and Oceana counties), and Traverse City (Grand Traverse, Kalkaska, and Leelanau counties). The other 51 labor markets are the counties in which the cities named in this table are located.

## PROSPECTS FOR 1982

The new contract between Ford and the UAW, and the prospect of one between GM and the UAW, eliminate the uncertainty surrounding the outlook for labor-management peace this fall. More importantly, they represent relaxation of the upward pressure on automotive wages. Perhaps their greatest impact will occur in the areas of employee involvement and productivity. More than anything else, U.S. industry must raise its productivity if it is to maintain market share in this country.

Other companies, particularly in the Detroit area, have renegotiated or are renegotiating contracts with their unions. The list will grow. This means that wages in Michigan's automotive centers will become more competitive with those in other parts of Michigan and the nation. The recent changes in workmen's compensation laws also will increase Michigan's competitiveness in regard to labor costs.

U.S. personal income taxes will be reduced on 1 July while spending on military procurement is rising. Very likely Social Security recipients also will receive increased benefits due to the inflation adjustment.

Meanwhile, money will be more plentiful in relation to demand. The supply is expected to continue to increase in the face of inventory reduction which curtails business financial needs. Consumers also have been repaying debt, which further reduces strains on financial markets. Also, the rate of increase in the Consumer Price Index will lie in the 4–6 percent range, providing there are no shocks such as a rise in food prices due to weather. Inflation was responsible for much of the pressure on interest rates during 1980–81.

The most recent projections by *Ward's Automotive Reports* suggest recovery in U.S. car production after an extremely depressed first quarter. Based on their scenario for the first nine months, car production for the year 1982 will total 5.7 million units. The 1981 figure was 6.2 million. Assuming a modest improvement in truck production, total vehicle assembly will stand at 7.6 million units during 1982 compared with 7.9 million for 1981. The number of vehicles rolling off Michigan assembly lines is likely to match 1981's 2.7 million.

A reasonable Michigan forecast is considerable improvement in April over a very depressed first quarter and a relatively flat economy between April and September. Expressed in number of wage and salary jobs, seasonally adjusted, the outlook is as follows:

| Period | Jobs |
|---|---|
| 1981, 4th quarter | 3,320,000 |
| 1982, 1st quarter | 3,200,000 |
| 1982, 2nd quarter | 3,240,000 |
| 1982, 3rd quarter | 3,245,000 |
| 1982, 4th quarter | 3,285,000 |

The sharp unturn in the fourth quarter assumes no credit crunch. Very tight money cannot be ruled out, however. Wall Street is uneasy about Washington's spending increases for military hardware and Social Security, simultaneously with the federal tax cut.

For the year as a whole, employment will be about 4 percent below the 1981 average if the forecast is borne out. The implication of this wage and salary forecast, patterned loosely after 1960 = 1981, 1961 = 1982, and 1962 = 1983, is 4 percent job growth between 1982 and 1983.

In southeast Michigan, General Motors is building new assembly plants in Detroit and near Pontiac. These are scheduled as 1984 replacements for antiquated facilities now in use. Considerable job loss because of automation and efficiencies in materials flow will occur. Assuming that the Japanese "just-in-time" system is developed at these new plants, suppliers will be encouraged to locate nearby. The Volkswagen plant planned for Sterling Heights also should attract suppliers and have other spinoff effects.

The simple fact of our being in the heartland of automotive manufacturing is an asset; there are economies in being near other plants. As U.S. capacity is reduced, the cutbacks are likely to be most pronounced in places distant from Michigan, Ohio, Ontario, and Indiana. This tendency is enhanced by the high import penetration of the West and East coasts, which reinforces the diseconomy of assembling cars in California and New Jersey. Ford already has closed its Mahwah, New Jersey, plant and General Motors, its Fremont and South Gate, California, plants. Ironically, legislation designed to provide domestic automotive jobs by forcing the Japanese to increase their production of vehicles in this country probably would work to the disadvantage of Michigan. It seems unlikely that Toyota and Datsun would assemble cars here. Production elsewhere would be a stimulus for suppliers to locate nearby.

On the minus side, it must be stressed that the popularity of small cars is not likely to diminish. Large cars will continue to diminish in size. These trends do not favor Michigan's steel mills, forging plants, and foundries. Smaller engines affect the market for Michigan-made piston rings and bearings.

Low skill automotive industry is leaving Michigan, not so much for inexpensive Southern labor as for the very low wage levels prevailing in Mexico, Spain, and Brazil. Some high skill operations such as engine making also are shifting there from the U.S.

Suppliers in this state are being pressured by General Motors, Ford, and Chrysler to cut prices of the products they sell to the Big Three. They can do this by shifting production to labor markets where the wage standards are set by farming, textile industries, furniture manufacturing, and other industries where wages and fringe benefits typically are low.

Because Detroit is unable to raise sufficient capital to finance all of the tooling and designing for the demands of the 1980s, more components will have to be sourced abroad. This is particularly true for engines, transmissions, and transaxles for front-wheel drive cars. Against this, a greater volume of export of Michigan specialties, such as stampings, forgings, and production machinery will be possible in the worldwide rationalization that is taking place.

Everything considered, Michigan can expect some job restoration in its automotive industry, to 550,000 or 600,000 during the next peak sales year but not the 700,000–750,000 at the previous peak. In the event of a Chrysler bankruptcy, cross off another 50,000–75,000 automotive jobs in this state.

Natural resources are a major asset. Forest products industries have been expanding in the Upper Peninsula and northern Lower Peninsula where trees are plentiful and labor is inexpensive. After the current slump, these industries can be expected to continue to grow rapidly. Cleveland Cliffs has ore reserves which have potential for new development if markets are favorable and if additional electric generating capacity becomes available in the UP. The White Pine Copper Company is installing a refinery at its smelter in Ontonagon County to remove silver from the yellow metal. That refinement will open new markets for Michigan copper.

Job growth is inevitable in the Grand Rapids area as a result of planned expansions currently underway in the office systems manufacturing industry. Besides hosting the major companies in this industry, Grand Rapids has a moderate wage, highly productive work force, almost no legacy of high-pollution industry, and is a pleasant area in which to raise a family.

Battle Creek is home to Fort Custer Industrial Park which has an enviable record of attracting new industry, particularly companies from overseas. Like Grand Rapids, this area can offer a modest wage, highly productive work force in a pleasant setting. For the same reason, growth in Kalamazoo seems likely to resume.

Lansing is a high wage area. Its future cannot be considered separately from that of Michigan State University whose agricultural college could attract high technology companies, particularly in the area of microbiology. Ann Arbor and the University of Michigan are capitalizing on outstanding engineering and medical colleges. Detroit has Wayne State University and the medical complex, providing a setting for medical robotics and electronics, as well as microbiology.

Flint, the state's highest wage area, is diversifying through development of a theme park based on the history of the automobile. Tourism is counted on to provide new jobs.

Prospects for the business travel-convention business in Detroit, Grand Rapids, Traverse City, Battle Creek, and lesser places are good. These developments plus increasing populations of affluent retirees and working couples bode well for restaurants, entertainment industries, and lodging establishments.

Michigan's prospects in the growing fields of information processing and automotive electronics are not clear. Comments made over two decades ago in this regard are valid today.

Electronics in the Midwest lacks the explosive character of electronics on the Pacific Coast and in New England. This region does not lead in the development of new ideas and in the opening up of new fronts of activity. This is because electronics in the Midwest has for over a quarter century been more interested in the exploitation and the refinement of existing ideas and existing product lines than in opening up new fields or activity. It has been more concerned with trying to make money by redesigning established products than with attempting to grow from the exploitation of new products.[2]

However, in other areas of high technology Michigan is among the leaders. Automotive research and development is an obvious example. Other areas of high research activity in this state are pharmaceuticals and metals. Michigan leads the nation in the volume of business done by noncaptive, for-profit commercial research and development laboratories that operate on a contract or fee basis.

All things considered, Michigan has favorable prospects beyond 1982; employment growth averaging 3.5 percent between 1982 and 1985 is not an unreasonable expectation but recovery such as occurred during the 1930s and 1960s is. Michigan will not be able to provide the kinds of private sector jobs to absorb 100,000 to 150,000 permanently displaced automotive workers.

### FOOTNOTES

1. Developed from David I. Verway, "Michigan's Automotive and Export Dependence," *The Michigan State Economic Record,* vol. 20, no. 9 (October 1978); *Motor Vehicle and Related Industries in Michigan* (Detroit: Michigan Employment Security Commission, 1981); and unpublished research by Maria C. Benson, Michael A. Fath, Sandra J. Friedle, David Naberhuis, and David I. Verway.
2. Frederick Emmons Terman, "Economics and Education in the Midwest," *The Michigan State Economic Record,* vol. 3, no. 1 (January 1961), p. 7.

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IN MICHIGAN

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# MICHIGAN'S ESSENTIAL INSURANCE AND NO-FAULT LAWS:

## Economic and Philosophic Issues

*by* THOMAS L. WENCK, *Department of Finance and Insurance, Michigan State University*

The Michigan legislature, presumably representing the best interests of the majority of citizens of the state, has enacted two pieces of legislation which profoundly affect homeowners, renters, automobile owners, and insurance companies. These acts are commonly known as Michigan's No-Fault Automobile Insurance Law and Michigan's Essential Insurance Act. Since both of these laws have been described frequently and extensively in the mass media, only brief summaries are provided in this article in Exhibits I and II. Instead, attention is directed to an economic and philosophic analysis of the effects of selected provisions of these two pieces of legislation, with emphasis on automobile insurance.

A careful examination of the specific provisions of the no-fault law and the essential insurance law reveals that our government has determined that a free enterprise private insurance industry is not in the public interest. The government has decreed, instead, that we will have a government mandated and controlled quasi-private property and casualty insurance industry. Michigan has imposed a form of socialism upon the property and casualty insurance companies operating within this state and also upon all of its citizens. It has not yet chosen the next step of offering competing coverage through a competitive state insurance company or the following step of a monopolistic mandatory state insurance fund. To claim, however, that our present automobile and home insurance is provided under a capitalistic free enterprise supply and demand system is false and a rejection of the facts.

For example, the rating constraints imposed upon the insurance industry are a form of rejection of the traditional, market-derived rating practice and the substitution instead of a social policy-directed rating requirement. Although the insurance mechanism is a socialistic enterprise when a single rate structure is employed, in practice, competition has resulted in rates which have tended to reflect the actual losses of the risks covered within a class. A fundamental private insurance principle is that the rate charged should reflect the probable loss cost of the risk insured. This is consistent with the principle of equity.

The rating law both prior to and after the enactment of the essential insurance law provides that property and casualty rates shall not be inadequate, excessive, or unfairly discriminatory. Although the law does not define "unfairly discriminatory," this criterion is included to permit discrimination in rates and rating classifications as long as the discrimination is not unfair. In other words, it is recognized that there are or may be differences in risks and that a rate which reflects

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a low loss probability, based on frequency or severity, is not unfair when compared with a rate which reflects a high loss probability, and, in fact, reflects an equitable or fair discrimination between two different risks. It is equitable to charge two distinctly different rates for two distinctly different risks, if those rates are fairly discriminatory between the risks.

The Essential Insurance Act prohibits insurers from using sex and marital status as rating factors. Yet insurance loss statistics conclusively show that these two variables have a profound effect on loss experience. If you are a woman, what economic or equitable justification is there for requiring you to subsidize a male whose loss probability and experience is higher than yours? Or for a married person with low loss experience to subsidize a single person with higher loss experience? There is no valid economic or equitable justification, but there is a social justification. Is this what we really want? Is it fair for the careful low or no loss driver to pay for the high loss driver?

The Michigan legislature's inclination toward imposing a social adequacy philosophy upon the insuring citizens of the state is also found in the No-Fault Automobile Insurance Law. No-fault is a misnomer since the law does permit tort actions based upon fault in certain bodily injury situations. A better title would have been a "partial compensation automobile insurance system," as that is what the legislature actually mandated. This is a social insurance program since coverage is mandatory.

As part of the no-fault law, a fundamental private right has been taken away from the individual citizens of the state. We have lost the right to recover the cost of property damage to our vehicles caused by a negligent driver or tortfeasor. The Essential Insurance Act modifies this loss in limited situations up to $400. Assume the following fact situation. You and your spouse have broad form collision coverage; you are waiting in your car for the red light to turn green when your car is struck in the rear by a driver who does not have his vehicle under control. Assume further that you and your spouse both suffer bodily injury and, as a result of the collision, your car sustains $5,000 of property damage. Since you have broad form collision coverage and since the other driver was 100 percent at fault, you will collect from your own automobile insurance company the $5,000 of property damage you sustained. The no-fault and essential insurance laws prohibit you from bringing a tort action against the negligent party who caused your property damage. If you did not carry collision coverage, the loss would fall upon you and your spouse, except you could bring a mini-tort action against the tortfeasor to recover the first $400 of your $5,000 loss, leaving you with a loss of $4,600. Again, is this equitable? Is it fair for you to bear the loss to which you did not contribute but which, instead, was caused by someone else who does not have to pay for the damages he caused?

As far as your bodily injury expenses are concerned, you would also have to recover these from your own automobile insurance policy under the personal injury protection (PIP) section of the no-fault law. Since the law provides unlimited medical and hospital expenses, your expenses would be covered in full, and, in effect, everyone with this insurance would be paying for the damages caused by the negligent driver. As Mr. Charles Trubac, regional vice-president of State Farm, recently said, "It is clear that Michigan no-fault has performed well for the consumers who have been victims of injuries sustained in automobile accidents. Equally though, our concern must be for the uninjured—that vast majority who must pay for the excessive generosity of no-fault benefits in Michigan."[1]

Mr. Trubac also pointed out that State Farm's PIP reserve increased 254 percent in the last five years, from $20.6 million in 1976 to $73 million at the end of 1981.[2] Part of this increase in PIP reserve is attributable to the annual increase in the work loss and dependent survivors' benefits, which are tied to the change in the Consumer Price Index from July 1 to June 30 of the following year. Exhibit III indicates what these increases have been since the no-fault law took effect on October 1, 1973. The maximum monthly benefit has increased from $1,000 in 1973 to $2,049 currently, which clearly shows the 104.9 percent increase in the Consumer Price Index in the last ten years. From 1976 to 1982 the benefit has increased 49 percent, from $1,373 to $2,049, which is substantially less than the 254 percent that State Farm increased its PIP reserve. The difference is accounted for by the increase in medical and hospital expenses, which are directly related to the actual charges made and which increased much faster than other components of the Consumer Price Index during this period. The PIP funeral expense benefit is statutorily fixed and is not indexed.

Several points may be made relative to the medical and hospital expense benefit of Michigan's no-fault automobile insurance. First, it is working very well in paying for expenses for automobile accident victims. Second, doctors and hospitals have been promptly reimbursed by the insurance companies. Third, there are no cost controls on the providers of services since the law allows unlimited benefits. Fourth, the cost of these benefits falls upon the entire insured motoring public rather than being charged directly to the person responsible for the loss. Once again we see a socialist philosophy imposed upon the citizens of the state.

The Essential Insurance Act, better known as PA 145, is a lengthy twenty-nine page complex piece of legislation. The substance of the law is summarized in Exhibit I. The impetus for the legislation was a report to the governor, drafted by the Michigan Insurance Bureau, entitled "Essential Insurance in Michigan: An Avoidable Crisis." The Michigan Insurance Bureau with a few other state insurance departments and the Federal Insurance Administration develolped what has been called the New View's regulatory position "that competition creates large scale insurance availability problems and widespread unfair discrimination in the prices for insurance."[3] A careful analysis of the Insurance Bureau's report and PA 145 reveals that the fundamental purpose of the act is to provide for the regula-

*(Continued on page 7)*

# A YEAR OF CHANGE: The Essential Insurance Act in 1981

*Note:* A Year of Change: The Essential Insurance Act of 1981 *is Part I of a study prepared by the Insurance Bureau, Michigan Department of Licensing and Regulation. The complete report, showing the effects of the law on both insurance consumers and the industry itself, is available from the bureau.*

## BACKGROUND

In the early and mid-1970s, the insurance market for personal lines coverages—auto and home, the "essential" insurance coverages—was not working well. The market was in fact often working against consumers.

Many good drivers were being forced to purchase very expensive coverage or to get their insurance through the Michigan Automobile Insurance Placement Facility (MAIPF) where they had no choice of insurer, a limited choice of coverage, and paid higher rates, even if their driving records were perfect. Since auto insurance is required in Michigan, this availability problem was troubling.

Many tenants and homeowners were being refused insurance or forced to buy coverage through the Michigan Basic Property Insurance Association (MBPIA, often called the FAIR Plan), where they paid high rates for very limited coverage. Since almost everyone wants and needs home insurance this situation, too, was a source of concern.

In addition, in 1977 and 1978, the Michigan Supreme Court was considering the case of *Shavers* v. *Attorney General,* which challenged the constitutionality of Michigan's no-fault insurance act. In its decision, the court held that the no-fault act was, in fact, constitutional, but that the ratemaking mechanisms were constitutionally inadequate to assure that the required coverage would be available at fair and equitable rates. The court also determined that Michigan drivers have a right to an explanation of how their individual rates are determined and a way to appeal decisions of insurance companies which they believe treated them unfairly. The court gave the legislature and the commissioner of insurance until the end of 1979 to address the shortcomings in the auto insurance market.

In response to the auto and home insurance affordability and availability problems, and with the added impetus of the Supreme Court decision, the legislature, after much negotiation and input from all those concerned with the workings of the insurance marketplace, developed what came to be known as the Essential Insurance Act.

The major provisions of Public Act 145 of 1979, as amended by Public Act 147 of 1979 and Public Act 461 of 1980, took effect on January 1, 1981. The act made important revisions in the underwriting and rating of private passenger auto insurance and home insurance in Michigan.

## PROVISIONS OF THE ACT

The Essential Insurance Act, by making significant changes in the auto and home insurance marketplace, works to eliminate unfairly discriminatory practices such as redlining and other affordability and availability problems encountered by many persons under the old insurance system. A major purpose of the act is to guarantee consumers the right to shop for the best coverage at the lowest price. The act gives consumers access to the standards upon which underwriting decisions are based, as well as a means to appeal those decisions.

Under the act, auto insurance means the mandatory no-fault coverages for private passenger non-fleet automobiles, as well as optional coverages which may be available, such as collision, comprehensive and uninsured motorists coverages.

Home insurance refers not only to homeowners package policies, which include theft and liability coverages, but also to fire insurance policies, which provide only property protection.

While the law affected most areas in the auto and home insurance marketplace, it had its greatest impact in three areas: underwriting, rating, and consumer rights.

## UNDERWRITING

In the past, the evaluation of an applicant prior to deciding whether to offer insurance was a process controlled solely by the agent or company, and the underwriting standards or rules followed in the process did not have to be written down or explained to the applicant. The resulting decisions were often based on an agent's first impression of the applicant.

The new law requires that all underwriting rules be written down and applied to everyone in the same manner. In other words, a person either meets a company's underwriting standards or doesn't; if he does, the company must offer that person insurance. Case-by-case subjective decision-making, which often resulted in unfair discrimination, is prohibited. The new law also specifies the only factors on which a company may base its underwriting rules. These factors are objective and directly related to risk.

All underwriting rules used by each company writing auto and home insurance in Michigan and all inspection criteria used by home insurers must be filed with the Insurance Bureau prior to use.

## RATING

While the law still requires that rates not be excessive, inadequate, or unfairly discriminatory, the prior approval of rates by the commissioner of insurance is no longer required. Rates will now be set by the competitive market. In addition, the new law requires that rates must be based on factors more directly related to risk. For home insurance, this means factors such as the amount and type of coverage, the availability of fire and police protection, and security and safety devices. For auto insurance, companies may consider charac-

*(Continued on page 7)*

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# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 41.8 | 40.3 | 41.6 (June) |
| Average weekly hours, U.S. | 40.2 | 39.0 | 39.2 (June) |
| Average hourly earnings, Michigan ($) | 10.56 | 11.28 | 11.40 (June) |
| Average hourly earnings, U.S. ($) | 7.97 | 8.45 | 8.51 (June) |
| U.S. motor vehicle production (units) | 893,335 | 707,086 | 779,580 (June) |
| Michigan electricity usage (mil. kwh.) | 5,921 | 5,415 | 5,656 (Mar.) |
| Industrial (mil, kwh.) | 2,704 | 2,170 | 2,445 (Mar.) |
| Residential (mil. kwt.) | 1,815 | 1,879 | 1,813 (Mar.) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 788 | 592 | 617 (May) |
| United States (000 net tons) | 11,374 | 6,982 | 6,578 (May) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 280.5 | 285.9 | 289.1 (June) |
| United States | 271.3 | 287.1 | 290.6 (June) |
| U.S. producer price index (1967 = 100) | 294.5 | 298.6 | 299.4 (June) |
| Michigan farm prices received index (1977 = 100) | 138 | 139 | 134 (June) |

Sources: U.S. Bureau of the Census; U.S Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

# Contracts for Future Building, First 6 Months: 1981 and 1982

(Thousands of Dollars)

| Area | Nonresidential | | | Residential | | | Total[a] | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | Percentage change | 1981 | 1982 | Percentage change | 1981 | 1982 | Percentage change |
| Ann Arbor | 27,810 | 39,534 | + 42 | 20,241 | 8,808 | − 56 | 48,051 | 48,432 | + 1 |
| Battle Creek | 11,326 | 13,612 | + 20 | 8,170 | 5,431 | − 34 | 19,496 | 19,043 | + 2 |
| Bay City | 2,600 | 5,343 | +106 | 3,444 | 5,343 | + 55 | 6,044 | 10,623 | + 76 |
| Detroit | 456,224 | 206,902 | − 55 | 199,311 | 104,195 | − 48 | 655,535 | 311,097 | − 53 |
| Flint | 21,935 | 9,603 | − 56 | 18,316 | 15,001 | − 18 | 40,251 | 24,604 | − 39 |
| Grand Rapids | 34,478 | 29,133 | − 16 | 61,039 | 41,081 | − 33 | 95,517 | 70,214 | − 26 |
| Jackson | 11,336 | 3,001 | − 74 | 9,668 | 3,703 | − 62 | 21,004 | 6,704 | − 68 |
| Kalamazoo-Portage | 22,961 | 55,353 | +141 | 39,898 | 16,659 | − 58 | 62,859 | 72,012 | + 15 |
| Lansing-East Lansing | 23,407 | 10,336 | − 56 | 60,777 | 17,764 | − 71 | 84,184 | 28,100 | − 67 |
| Muskegon-Norton Shores-Muskegon Heights | 6,891 | 8,427 | + 22 | 13,393 | 9,086 | − 32 | 20,284 | 17,513 | − 14 |
| Saginaw | 5,698 | 13,639 | +139 | 15,723 | 4,034 | − 74 | 21,421 | 17,673 | − 17 |
| Toledo | 96,099 | 53,188 | − 45 | 81,581 | 34,289 | − 58 | 177,680 | 87,477 | − 51 |
| Michigan | 726,268 | 454,218 | − 37 | 617,525 | 355,142 | − 42 | 1,343,793 | 809,360 | − 40 |
| United States | 29,158,200 | 27,082,300 | − 7 | 32,645,100 | 25,748,400 | − 21 | 61,803,300 | 52,830,700 | − 15 |

Source: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

Note: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing-East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; Muskegon-Norton Shores-Muskegon Heights includes Muskegon and Oceana counties; and Toledo includes Monroe County, Michigan, and Fulton, Lucas, Ottawa, and Wood counties, Ohio.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1981 and 1982 figures for nonbuilding construction contracts were $506,062,000 and $308,968,000 respectively, or a decrease of 39 percent. For the United States they were $17,721,800,000 and $18,191,400,000 respectively, or an increase of 3 percent. Total building and nonbuilding construction contracts declined by 40 percent in Michigan and 11 percent nationwide.

# Quarterly Personal Income in Michigan

| | Millions of dollars, annual rates, seasonally adjusted | | | | | | | Percentage change | |
|---|---|---|---|---|---|---|---|---|---|
| | 1980 | | 1981 | | | | 1982 | 81(4) to 82(1) | |
| | 3 | 4 | 1 | 2 | 3 | 4 | 1 | Michigan | United States |
| **TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK** | | | | | | | | | |
| **BY TYPE** | | | | | | | | | |
| Wage and salary disbursements | 55,913 | 59,567 | 60,308 | 61,357 | 61,585 | 60,696 | 61,056 | + .6 | + 1.0 |
| Other labor income | 7,784 | 8,457 | 8,551 | 8,828 | 8,817 | 8.712 | 8,913 | + 2.3 | + 2.1 |
| Proprietors income | 4,540 | 4,769 | 4,768 | 4,796 | 4,847 | 4,858 | 4,633 | − 4.6 | − 5.7 |
| Farm | 502 | 542 | 464 | 515 | 566 | 606 | 413 | −31.8 | −30.6 |
| Nonfarm | 4,038 | 4,227 | 4,304 | 4,281 | 4,281 | 4,252 | 4,220 | − .8 | − .7 |
| **BY INDUSTRY** | | | | | | | | | |
| Farm | 714 | 754 | 679 | 736 | 791 | 836 | 649 | −22.4 | −19.8 |
| Nonfarm | 67,523 | 72,039 | 72,947 | 74,245 | 74,458 | 73,430 | 73,953 | + .7 | + 1.0 |
| Private | 58,093 | 62,464 | 63,338 | 64,365 | 64,334 | 63,161 | 63,746 | + .9 | + .9 |
| Ag. Serv., For., Fish., and other | 181 | 181 | 194 | 191 | 190 | 194 | 195 | + .5 | + 1.0 |
| Mining | 326 | 367 | 370 | 362 | 390 | 377 | 388 | + 2.9 | + .4 |
| Construction | 2,772 | 3,051 | 3,087 | 2,947 | 2,802 | 2,754 | 2,647 | − 3.9 | + .5 |
| Manufacturing | 26,785 | 29,931 | 30,447 | 31,664 | 31,142 | 29,768 | 30,207 | + 1.5 | − .2 |
| Nondurable goods | 4,451 | 4,687 | 4,745 | 4,896 | 4,942 | 4,831 | 4,986 | + 3.2 | + .8 |
| Durable goods | 22,334 | 25,244 | 25,702 | 26,768 | 26,200 | 24,938 | 25,220 | + 1.1 | − .7 |
| Transportation and public utilities | 3,987 | 4,213 | 4,102 | 4,023 | 4,088 | 4,103 | 4,161 | + 1.4 | + 1.1 |
| Wholesale trade | 3,727 | 3,855 | 3,937 | 3,955 | 4,005 | 4,051 | 4,004 | − 1.2 | + 1.1 |
| Retail trade | 6,268 | 6,454 | 6,552 | 6,530 | 6,640 | 6,567 | 6,524 | − .7 | + 1.1 |
| Finance, insurance, and real estate | 3,033 | 3,115 | 3,019 | 3,029 | 3,044 | 3,088 | 3,127 | + 1.3 | + 1.5 |
| Services | 11,013 | 11,297 | 11,632 | 11,664 | 12,033 | 12,259 | 12,492 | + 1.9 | + 2.2 |
| Government and government enterprise | 9,430 | 9,575 | 9,610 | 9,880 | 10,123 | 10,269 | 10,208 | − .6 | + 1.5 |
| Federal, civilian | 1,177 | 1,204 | 1,186 | 1,194 | 1,234 | 1,271 | 1,252 | − 1.5 | + 1.2 |
| Federal, military | 192 | 213 | 209 | 212 | 217 | 252 | 249 | − 1.2 | + .6 |
| State and local | 8,061 | 8,159 | 8,214 | 8,473 | 8,672 | 8,746 | 8,707 | − .4 | + 1.7 |
| **DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE** | | | | | | | | | |
| Total labor and proprietors income by place of work | 68,237 | 72,793 | 73,626 | 74,982 | 75,249 | 74,266 | 74,602 | + .5 | + .6 |
| Less: Personal contributions for social insurance by place of work | 3,586 | 3,889 | 4,265 | 4,293 | 4,274 | 4,198 | 4,376 | + 4.2 | + 4.3 |
| Net labor and proprietors income by place of work | 64,651 | 68,904 | 69,361 | 70,689 | 70,975 | 70,068 | 70,226 | + .2 | + .4 |
| Plus: Residence adjustment | 445 | 450 | 500 | 501 | 515 | 516 | 514 | − .4 | + 1.5 |
| Net labor and proprietors income by place of residence | 65,096 | 69,354 | 69,861 | 71,190 | 71,490 | 70,584 | 70,740 | + .2 | + .4 |
| Plus: Dividends, interest, and rent | 13,087 | 13,410 | 14,219 | 14,788 | 15,481 | 16,047 | 16,475 | + 2.7 | + 2.5 |
| Plus: Transfer payments | 14,213 | 14,150 | 14,436 | 15,003 | 15,852 | 16,392 | 16,759 | + 2.2 | + 2.1 |
| State U.I. benefits | 1,709 | 1,242 | 1,059 | 1,287 | 1,167 | 1,403 | 1,401 | − .1 | +14.3 |
| Transfers excluding state U.I. | 12,504 | 12,908 | 13,376 | 13,716 | 14,685 | 14,989 | 15,358 | + 2.5 | + 1.5 |
| Personal income by place of residence | 92,396 | 96,914 | 98,515 | 100,981 | 102,823 | 103,023 | 103,974 | + .9 | + 1.0 |

Source: Bureau of Economic Analysis, special release.

# Year-to-Year Change in Selected Economic Indicators

| | Percentage change from previous year | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | | | | | | | 1982 | | | | | |
| Indicator | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June |
| **Civilian Employment** | | | | | | | | | | | | | |
| United States | + 1.6 | + 1.9 | + 1.9 | + 1.1 | + 1.0 | + 0.7 | 0 | − 0.3 | − 0.5 | − 0.9 | − 1.5 | − 0.9 | − 0.7 |
| Michigan | + 3.8 | + 3.8 | + 2.8 | + 1.7 | + 1.9 | + 1.4 | − 2.5 | − 2.1 | − 1.0 | − 3.4 | − 5.0 | − 3.5 | − 5.0 |
| Detroit area SMSA[a] | + 2.9 | + 2.4 | + 1.2 | + 0.8 | + 0.6 | + 0.6 | − 3.7 | − 3.0 | − 2.2 | − 4.3 | − 5.8 | − 4.2 | − 5.8 |
| Outstate[b] | + 4.6 | + 5.1 | + 4.2 | + 2.5 | + 2.9 | + 2.1 | − 1.5 | − 1.3 | − 0.1 | − 2.7 | − 4.4 | − 2.9 | − 4.4 |
| **Wage and Salary Jobs[c]** | | | | | | | | | | | | | |
| United States | + 1.4 | + 1.9 | + 1.5 | + 1.4 | + 1.1 | + 0.5 | − 0.1 | − 0.5 | − 0.5 | − 0.8 | − 1.1 | − 1.1 | − 1.4 |
| Michigan | − 0.1 | + 0.3 | − 0.7 | + 0.3 | − 1.9 | − 2.9 | − 4.3 | − 4.4 | − 4.0 | − 4.5 | − 5.4 | − 5.1 | − 5.0 |
| Detroit area SMSA[a] | − 0.7 | − 0.6 | − 1.6 | − 0.7 | − 2.6 | − 3.5 | − 5.0 | − 4.7 | − 4.7 | − 4.8 | − 5.7 | − 5.5 | − 6.0 |
| Outstate[b] | + 0.4 | + 1.2 | + 0.1 | + 1.2 | − 1.2 | − 2.3 | − 3.6 | − 4.1 | − 3.3 | − 4.1 | − 5.1 | − 4.8 | − 4.1 |
| **Average Workweek[d]** | | | | | | | | | | | | | |
| United States | + 2.0 | + 2.1 | + 1.3 | − 0.8 | − 0.3 | − 1.2 | − 2.2 | − 7.0 | − 0.8 | − 2.0 | − 2.5 | − 2.7 | − 2.5 |
| Michigan | + 6.7 | + 3.3 | + 3.0 | − 3.5 | − 1.5 | − 2.7 | − 4.3 | −10.5 | + 2.3 | − 2.9 | − 1.0 | − 2.2 | − 0.5 |
| **Average Weekly Earnings[e]** | | | | | | | | | | | | | |
| United States | +12.8 | +12.3 | +11.2 | + 9.0 | + 8.5 | + 6.6 | + 5.0 | + 1.3 | + 6.8 | + 5.0 | + 4.2 | + 3.8 | + 4.1 |
| Michigan | +19.5 | +14.7 | +15.0 | + 6.9 | + 7.5 | + 5.9 | + 2.7 | + 1.9 | +11.0 | + 5.2 | + 7.2 | + 5.6 | + 7.4 |
| **Motor Vehicle Assembly** | | | | | | | | | | | | | |
| United States | +40.6 | +25.6 | +25.4 | −12.4 | −18.4 | −24.6 | −24.2 | −33.1 | −23.7 | −15.7 | −16.2 | −14.3 | −12.7 |
| Michigan | +58.9 | +73.9 | +53.5 | + 7.3 | − 3.5 | −13.6 | −20.4 | −19.4 | − 8.3 | − 6.9 | − 4.3 | − 6.9 | − 4.8 |
| General Motors | +50.8 | +45.5 | +29.8 | + 7.5 | + 4.3 | − 6.2 | − 9.7 | −16.3 | + 3.1 | −12.3 | −12.1 | −14.4 | + 1.3 |
| Ford | +52.8 | +99.9 | +59.3 | +14.1 | −10.5 | −30.7 | −53.7 | −46.0 | −19.5 | + 9.2 | +16.8 | +19.5 | − 6.6 |
| Chrysler | +131.4 | +711.6 | +255.6 | − 9.9 | −22.8 | −11.8 | −12.7 | +20.2 | −44.5 | − 6.8 | − 0.8 | −13.5 | −30.0 |
| **Steel Tonnage Poured** | | | | | | | | | | | | | |
| United States | +39.3 | +49.5 | +44.2 | +23.8 | − 4.7 | −20.8 | −24.6 | −26.9 | −28.4 | −31.5 | −37.9 | −41.3 | |
| Michigan | +103.8 | +81.2 | +75.7 | +25.3 | −21.4 | −22.4 | −13.3 | −35.1 | −35.8 | −34.2 | −25.8 | −21.7 | |
| **Commercial Electricity Consumption** | | | | | | | | | | | | | |
| United States | + 7.5 | + 5.1 | + 0.3 | − 0.3 | + 1.7 | + 2.1 | + 2.3 | + 4.0 | + 5.1 | + 5.5 | | | |
| Michigan | + 4.7 | + 4.5 | + 1.1 | − 0.2 | − 1.9 | − 2.6 | 0 | − 2.8 | + 4.0 | − 0.8 | | | |
| **Industrial Electricity Consumption** | | | | | | | | | | | | | |
| United States | + 7.3 | + 9.4 | + 6.9 | + 2.0 | − 0.4 | − 2.2 | − 6.4 | − 6.2 | − 6.9 | − 6.0 | | | |
| Michigan | +25.0 | +13.2 | + 8.1 | − 0.8 | − 9.7 | − 7.6 | −19.4 | −10.7 | −17.2 | − 9.6 | | | |
| **Nonresidential Construction Contracts** | | | | | | | | | | | | | |
| United States | | | | | | | | | | | −16 | −15 | +10 |
| Michigan | −38 | −33 | +16 | −11 | −38 | −76 | −52 | −24 | −52 | −14 | −55 | −62 | +30 |
| **Residential Construction Contracts** | | | | | | | | | | | | | |
| United States | | | | | | | | | | | −15 | −29 | − 5 |
| Michigan | + 6 | −22 | −40 | −36 | −47 | −60 | −53 | −44 | −58 | −47 | −42 | −36 | −29 |
| **Nonbuilding Construction** | | | | | | | | | | | | | |
| United States | | | | | | | | | | | + 8 | + 5 | + 8 |
| Michigan | −17 | − 9 | − 3 | +32 | − 8 | −17 | + 9 | + 7 | −52 | −37 | −72 | − 1 | −23 |
| **Retail Sales** | | | | | | | | | | | | | |
| United States | +13.5 | +11.1 | + 9.5 | +10.9 | + 6.3 | + 4.7 | + 5.7 | + 0.2 | + 2.7 | + 2.6 | + 2.6 | + 3.8 | + 1.1 |
| Michigan | +10.8 | + 5.4 | + 5.4 | + 7.3 | + 1.3 | + 0 | + 0.5 | −11.2 | − 6.3 | − 5.7 | − 5.3 | + 0.3 | − 4.2 |
| Detroit Area[a] | + 8.0 | + 3.6 | + 2.3 | + 4.3 | − 1.6 | − 2.6 | − 3.9 | −17.2 | −13.6 | −14.3 | −14.6 | − 8.3 | − 9.7 |
| Outstate[b] | +13.1 | + 7.3 | + 8.8 | +10.5 | + 4.9 | + 2.9 | + 5.7 | − 4.2 | + 2.2 | + 4.2 | + 5.7 | + 9.9 | + 1.2 |
| **Consumer Price Index** | | | | | | | | | | | | | |
| United States | + 9.6 | +10.7 | +10.9 | +11.0 | +10.2 | + 9.6 | + 8.9 | + 8.4 | + 7.7 | + 6.8 | + 6.6 | + 6.7 | + 7.1 |
| Detroit[a] | + 9.3 | +11.6 | +11.1 | + 9.5 | + 6.5 | + 5.0 | + 3.2 | + 4.6 | + 2.8 | + 3.7 | + 4.1 | + 3.9 | + 3.1 |

Source: Michigan Employment Security Commission, special release; Bureau of Labor Statistics, **The Employment Situation** (monthly); Motor Vehicle Manufacturers Association, special release; American Iron and Steel Institute, special release; Energy Information Administration, special release; F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases (monthly); and Bureau of the Census, **Monthly Retail Trade.**

a. Wayne, Oakland, Macomb, Livingston, Lapeer, and St. Clair counties.
b. Michigan minus Detroit area.
c. The number of wage and salary jobs, except agricultural, reported by employers.
d. Average hours worked by manufacturing production workers.
e. Average earnings among manufacturing production workers.

## A YEAR OF CHANGE: THE ESSENTIAL INSURANCE ACT IN 1981

*(Continued from page 3)*

teristics such as the age of the driver or length of driving experience, driving record, and amount of insurance.

In addition, the law limits the number of different territorial base rates which a company may utilize in its rating plan to twenty for auto insurance and three for home insurance. The law also sets limits on the relationship between the highest and lowest rated territories for identical coverages and, for auto insurance, the differential between adjacent territories. This adjacency constraint was developed on the theory that while the risk of loss may vary among territories, the difference in risk among adjacent territories was clearly not enough to support the wide variation in auto rates which had occurred in the past.

### CONSUMER RIGHTS AND INFORMATION

By requiring companies to offer insurance to all eligible persons and to apply underwriting rules uniformly, the act guarantees consumers the right to shop around for the best coverages at the lowest rates. To encourage competition, insurance agents are required to provide eligible persons with the lowest premium quote available through that agent for the insurance requested. To help consumers become better informed, the law requires they be provided with a variety of information regarding how the rate for the policy was determined and how a person can challenge a company's underwriting or rating decision.

In the past, a consumer who believed he had been treated unfairly had few options. The Essential Insurance Act sets forth a procedure by which a person may appeal a company's decision.

Under the new law, if a person believes he has been unfairly denied insurance or charged an improper rate, he may request a private, informal, managerial-level conference with a representative of the company who has authority to make a decision in the matter. If the company fails to respond to the request within thirty days, or if the person is not satisfied with the response, the matter can be appealed to the commissioner of insurance.

Further, an insured or applicant must be given the specific reasons he was nonrenewed, cancelled or turned down for insurance. If insurance is terminated, the reasons must be give as part of the nonrenewal or cancellation notice to a policyholder. If an applicant is turned down for insurance, the reasons for denial must be written if the application was made in writing or, in the case of an oral application, must be put in writing at the request of the applicant. In addition, a policyholder must be told the factors on which he is rated and must be allowed access to more detailed rating information.

In general, the Essential Insurance Act was designed to correct the inequities in the old system and to make essential insurance coverages available to most Michigan citizens at reasonable rates.

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## MICHIGAN'S ESSENTIAL INSURANCE AND NO-FAULT LAWS

*(Continued from page 2)*

tion of rates and to increase the availability of home and automobile insurance.

In fact, however, the private insurance industry was providing a high-risk pool for those who could not find insurance in the voluntary market through the Michigan Basic Property Insurance Association and the Michigan Automobile Insurance Placement Facility. Strictly speaking, there was no insurance availability problem for automobile and property insurance. While there were some problems with respect to service, type of coverage, social stigma, and distribution of costs, the technical problem of making essential insurance available was largely solved. The problems which existed were capable of being solved within a competitive system.[1] The Michigan Insurance Bureau and the legislature chose instead to impose governmental regulation on personal automobile and property insurance lines to the extent that a competitive free market operation is legally impossible and is currently nonexistent in this state.

The effects and probable long run ramifications of this type of social legislation are very profound. Just as it has taken approximately fifty years for people to realize that the Social Security Act as amended is an unsound piece of legislation which is essentially a massive income transfer system, it will undoubtedly take many years before most people realize and accept the fact that Michigan's No-Fault Automobile Insurance Law and Essential Insurance Act are unsound pieces of social legislation.

The cross-subsidization that flows under such legislation is substantial. It flows from the good driver to the poor driver. It flows from the lower risk, middle-aged, higher income group to the higher risk, younger driver, especially males, with presumably lower incomes. It flows from the outstate communities and upper peninsula to Flint and Detroit. Automobile insurance rates are estimated to have decreased 22 percent in Detroit compared to a 4 percent increase for most of the rest of the state since the Essential Insurance Act was adopted. It flows from lower risk women drivers to higher risk male drivers. The practice of the New View has been to balance large rate reductions to high risk insureds with relatively small rate increases to low risk insureds. This is the rationale for the New View's utility function and its political appeal. It is a form of socialism and is essentially an income transfer system. One must ask again, "Is this really what a majority of the citizens of this state want and need?"

### FOOTNOTES

1. "Finds 'Unlimited' Flaws in Michigan No-Fault," *National Underwriter,* P & C Ed., June 4, 1982, p. 28.
3. Richard A. Schmalz, "Problems of Insurance Availability—'Redlining,' Part II," *CPCU Journal,* vol. 34, no. 1 (March 1981), p. 25. See also "Problems of
2. Ibid.

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Insurance Availability—'Redlining,'" *CPCU Journal*, vol. 33, no. 4 (December 1980), pp. 149–157.

4. Ibid., p. 151.

### EXHIBIT I

### Summary of Michigan's Essential Insurance Act

**HOME INSURANCE**

- I. Two homeowner's types of policies available
  - A. Traditional replacement cost policy. You must carry insurance equal to at least 80 percent of the replacement cost of the property.
  - B. New repair cost policy. You must carry insurance equal to 100 percent of the market value of the property or 100 percent of the actual cash value under a renter's policy.
- II. Two bases for qualifying for coverage
  - A. In the regular market, the law specifies conditions which make you ineligible.
  - B. Outside the regular market, the Michigan Basic Property Insurance Association for those ineligible for coverage in the regular market.
- III. Rating limitations
  - A. The law allows an insurer no more than three different territory rate bases.
  - B. For homeowners, the base rate in the lowest rated territory cannot be less than 70 percent of the base rate in the highest rated territory for the same policy.
  - C. For renters, the base rate in the lowest rated territory cannot be less than 65 percent of the base rate in the highest rated territory for the same policy.
  - D. The law specifies the factors upon which rates may be based.

**AUTOMOBILE INSURANCE**

- I. Two bases for qualifying for coverage
  - A. In the regular market, the law specifies conditions which make you ineligible and why an eligible person may be denied coverage.
  - B. Outside the regular market, the Michigan Automobile Insurance Placement Facility.
- II. Rating limitations
  - A. The law allows an insurer no more than twenty different territory rate bases with five possible exemptions within the state.
  - B. The base rate in the lowest rated territory cannot be less than 45 percent of the insurer's rate for the same policy in the highest rated territory.
  - C. The base rate in one territory may not be less than 90 percent of the rate for the same coverage in an adjacent rating territory.
  - D. The law specifies other rating variables which may be considered and provides that sex and marital status may not be used as rating factors.

Source: PA 145, 1979.

### EXHIBIT II

### Summary of Michigan's No-Fault Automobile Insurance Law

**Applies to owners of:**

- I. All motor vehicles required to be registered in Michigan.
- II. All motor vehicles driven in Michigan for more than 30 days in any calendar year.

**Mandatory Coverages:**

- I. PIP, Personal Injury Protection, applies in and out of state
  - A. Medical and Hospital Expenses, unlimited.
  - B. Funeral Expenses, $1,000 per person.
  - C. Work Loss (currently)
    - 1. Lost income, 85% or up to $2,049 per month for a maximum of 36 months ($73,764).
    - 2. Substitute services, up to $20/day. (Combined work loss cannot exceed $2,049/mo.)
  - D. Dependent Survivors, up to $2,049 per month for a maximum of 36 months.
- II. Residual Liability Insurance, minimum coverage
  - A. Bodily Injury, $20,000 each person, $40,000 each occurrence.
  - B. Property Damage, $10,000 each occurrence.

**Optional Coverages:**

- I. Collision coverage options
  - A. No coverage
  - B. Limited collision
  - C. Regular collision
  - D. Broad form collision
- II. Comprehensive coverage
- III. Uninsured Motorists Coverage
- IV. Towing and Labor Costs Coverage
- V. "Buy-Back" up to $400 of Excluded Property Damage Liability Coverage

Source: PA 294, 1972 and PA 145, 1979.

### EXHIBIT III

### Michigan's No-Fault Automobile Insurance Maximum Lost Income Work Loss Benefit

| Period | Maximum Amount/Mo. | 36 Mo. Max. | Annual % Increase | Cumulative % Increase |
|---|---|---|---|---|
| 10/1/73 - 9/30/74 | $1,000 | $36,000 | | |
| 10/1/74 - 9/30/75 | 1,111 | 39,996 | 11.1% | 11.1% |
| 10/1/75 - 9/30/76 | 1,213 | 43,668 | 9.2 | 21.3 |
| 10/1/76 - 9/30/77 | 1,285 | 46,260 | 5.9 | 28.5 |
| 10/1/77 - 9/30/78 | 1,373 | 49,428 | 6.8 | 37.3 |
| 10/1/78*- 9/30/79 | 1,475 | 53,100 | 7.4 | 47.5 |
| 10/1/79 - 9/30/80 | 1,636 | 58,896 | 10.9 | 63.6 |
| 10/1/80 - 9/30/81 | 1,870 | 67,320 | 14.3 | 87.0 |
| 10/1/81 - 9/30/82 | 2,049 | 73,764 | 9.6 | 104.9 |

Source: Author's records and Insurance Bureau Bulletin 81-17.
*Survivors benefits are indexed with work loss benefits since 10/1/78.

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# EXPORT UPDATE

by DAVID I. VERWAY, *Director, Bureau of Business Research, School of Business Administration, Wayne State University*

The number of Michigan jobs directly and indirectly related to the export of manufactured products totaled 237,000 during 1980, according to the most recent export origin report released by the Bureau of the Census. This figure represents 6.6 percent of total Michigan civilian employment in that year. Using this percentage as an index of dependence on manufactured exports, Michigan was tied for fourth place with Ohio. The leaders were Rhode Island (7.5 percent), Connecticut (7.2 percent), and Washington (6.7 percent). Nationwide, 4,778,900 jobs, or 5 percent of civilian employment, resulted from exports of manufactured products.

Comparison of data with the previous such survey reveals that between 1977 and 1980 Michigan's civilian employment related to manufactured exports increased by about 19 percent in the face of a 1 percent decline in total civilian employment. In other words, our export dependence increased; without exports, employment would have declined even more. As the figures in Table 1 show, export employment in this state increased in all the major manufacturing industry groupings except rubber and plastics.

Also conspicuous in these data is Michigan's failure to maintain its share of the United States export total in several important categories. Much of our declining share of United States manufactured exports can be attributed to the depressed automotive industry, causing a slump in vehicle and component exports to Canada. The drop in two categories, however, cannot be attributed to vehicle trade with Canada, namely, machinery and furniture and fixtures. While the data are far from perfect, they do suggest that Michigan's competitive edge has been dulled in these categories of exports.

## DIRECT EXPORTS

During spring 1981, all manufacturing establishments with 250 or more employees and selected establishments with fewer than 250 were asked by the Bureau of the Census to report the value of their direct exports to other countries during the previous year. Direct exports are products sent directly from the plant to another country or those known to have been exported, without further processing, through a broker or another intermediary. Because a vast number of small establishments did not have to report, the figures are well below the known volume of exports tabulated from shippers' export declarations. Also, a sizable volume of exporting occurs without the producer's knowledge. Northern hardwood, for example, might go by truck or rail to Minneapolis, then to New Orleans by barge, and finally to Japan by ship.

The purpose of the survey was to develop estimates of the geographic origin of total manufactured exports. The results of the census survey of establishments were used to estimate United States export figures by state and by industry. Also, the results were adjusted to represent the value of the shipment at the plant, before transportation and other costs of getting it to the United States border were added.

**Michigan's Essential Insurance and No-Fault Laws:**
**A Critique by Tom Downs / page 3**

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## TABLE 1
## Michigan's Civilian Employment Related to Manufactured Exports: 1977 and 1980

| Industry group | Michigan manufactured, export-related employment (000) | | Michigan manufactured, export-related employment as a percent of employment | | Michigan manufactured, export related employment as a percent of U.S. manufactured export-related employment | |
|---|---|---|---|---|---|---|
| | 1977 | 1980 | 1977 | 1980 | 1977 | 1980 |
| **Manufacturing industries** | | | | | | |
| Food and kindred products | 1.4 | 1.5 | 3.0 | 3.3 | 2 | 2 |
| Textile mill products | .2 | .3 | 7.6 | 9.9 | — | — |
| Apparel, other textile products | 1.7 | 6.9 | 6.6 | 37.0 | 6 | 7 |
| Lumber and wood products | 1.1 | 1.2 | 7.3 | 8.5 | 2 | 2 |
| Furniture and fixtures | .6 | .6 | 2.7 | 2.6 | 7 | 5 |
| Paper and allied products | 1.5 | 1.9 | 6.4 | 8.4 | 3 | 3 |
| Printing and publishing | .4 | .9 | 1.1 | 2.3 | 2 | 1 |
| Chemical and allied products | 5.4 | 6.0 | 15.9 | 19.3 | 4 | 4 |
| Rubber, miscellaneous plastics products | 2.9 | 2.6 | 8.1 | 10.1 | 5 | 3 |
| Stone, clay, glass products | 1.9 | 2.0 | 9.4 | 11.1 | 5 | 4 |
| Primary metal industries | 13.3 | 13.5 | 16.0 | 19.6 | 8 | 6 |
| Fabricated metal products | 19.9 | 21.1 | 13.9 | 17.7 | 12 | 10 |
| Machinery, except electrical | 21.8 | 26.7 | 14.9 | 17.4 | 6 | 5 |
| Electric, electronic equipment | 4.0 | 4.9 | 11.7 | 14.0 | 2 | 1 |
| Transportation equipment | 39.4 | 40.1 | 12.2 | 15.9 | 16 | 13 |
| Instruments, related products | 1.6 | 2.5 | 13.7 | 19.6 | 2 | 2 |
| Miscellaneous manufacturing industries | .5 | 2.3 | 5.5 | 21.6 | 2 | 2 |
| Central administration offices, auxiliary | 14.3 | 22.3 | 13.6 | 17.6 | 12 | 12 |
| Total manufacturing | 132.7 | 158.1 | 11.9 | 15.5 | 7 | 6 |
| **Nonmanufacturing industries** | | | | | | |
| Trade | 16.7 | 23.1 | 2.4 | 3.1 | 3 | 3 |
| Business services | 14.4 | 17.0 | 17.7 | 18.6 | 7 | 6 |
| Transportation, communication, and utilities | 12.4 | 15.6 | 8.2 | 10.2 | 7 | 6 |
| Other[1] | 18.3 | 23.2 | 1.2 | 1.4 | 5 | 4 |
| Grand total[2] | 194.5 | 237.0 | 5.3 | 6.6 | 6 | 5 |

SOURCE: Bureau of the Census, *1980 Annual Survey of Manufactures, Origin of Exports of Manufactured Products,* (Washington, D.C.: 1982), M80 (AS)-6 and similar document for 1977.

1. Includes construction, mining, and agriculture, as well as government and other services.
2. Civilian employment is defined here as the sum of manufacturing employment estimates from the *Annual Survey of Manufacturers* and nonmanufacturing employment from the current population survey. The figures are less than those developed by the Michigan Employment Security Commission but are utilized here because of their consistency with export-related employment and with export dependency figures for other states.

More than $16 billion in direct exports originated in California. Michigan was sixth with $8.8 billion. Michigan and Ohio capture a large share of the Canadian market for cars and trucks, as well as components for motor vehicles. The Canadian automobile agreement (Automotive Products Trade Act of 1965) allows producers to ship parts and completed vehicles between the two countries without duties and other trade restrictions, although there are some controls. For example, Chrysler Corporation assembles all of its large, rear-driven passenger cars in Windsor, irrespective of where they are sold; parts for these vehicles are fabricated in both countries. Largely because of the agreement, about two-fifths of U.S. exports of motor vehicles and parts were shipped from Michigan plants. These represent two-thirds of Michigan exports. Other significant Michigan direct exports include construction, industrial, and farm and garden machinery; pharmaceuticals; large home appliances; and meat products.

## SUPPORTING MANUFACTURED EXPORTS

Indirect manufactured exports include components, parts, and supplies that are made in other plants and incorporated into the products of plants which actually export. These supporting or embodied exports were evaluated by means of an input-output matrix, a set of equations designed to measure, among other things, how much every other industry must produce to enable any one industry to export what it does. After making these calculations for each industry, the Bureau of the Census allocated the figures among the states based on each state's share of U.S. production that was not exported.

In value of embodied exports in the 1980 ranking, Texas was first with $9.3 billion; California was second with $8.6 billion; Ohio was third with $7.8 billion; Pennsylvania was fourth with $7.4 billion; Ilinois was fifth with $6.7 billion; New York was sixth with $6.0 billion; and Michigan was seventh with $5.4 billion. In 1977, the previous such tally by the Bureau of the Census, Michigan was second behind California.

## JOB CREATION

Estimates of the number of factory jobs generated by manufactured exports were developed on the assumption that the percentage of jobs so created was the same as exports' percentage of total factory shipments. For Michigan, the number of such jobs was 158,100 or 15.5

*(Continued on page 6)*

# Michigan's Essential Insurance and No-Fault Laws: A Critique

*by* TOM DOWNS

Note: This article was written in response to the article written by Thomas L. Wenck which appeared in the July-August 1982 issue of *The Michigan Economy*. Tom Downs is an attorney with the firm of Downs, Zagaroli and Downs, P.C., Lansing, Michigan. He has been a member of the National Conference of Commissioners on Uniform State Laws since 1969 and is past chairman of its committee on no-fault insurance.

An examination of Thomas Wenck's article could well start with an analysis of why Michigan adopted the No-Fault Automobile Insurance Law and later the Michigan Essential Insurance Act. This requires a brief historical analysis of Michigan tort law before the no-fault law was adopted.

Under pure tort law, a person would only collect for injuries caused by another, if there was no negligence on the part of the individual trying to collect. This meant that if two automobiles were in an accident, only one driver could collect, because both could not be totally free from fault. Therefore, one driver had to suffer the economic loss himself.

The old-fashioned tort paid benefits in one lump sum—often in a jury trial years after the accident. The settlement paid for hospital and medical costs incurred and for wages lost up to the time of settlement. But those payments could be made two or more years after the accident. The payments made in the settlement for future economic losses would be inaccurate in amount since no one can anticipate exactly what future medical and other economic losses would be.

Extensive studies have shown that in the tort system the tendency was for underpayment for serious losses and overpayment for minor losses, with the greatest economic hardship on low and middle income families.[1] Low income groups, for reasons of economic necessity, needed to make settlements in order to receive money for daily living expenses. Probably the worst criticism of the tort system was that it was counterrehabilitative. The injured person, waiting for a settlement, would only too often have the aches and pains increase as the person read about large awards given to others that he knew were not hurt as badly. Preoccupation was with settlement rather than with getting back into the economic mainstream. This problem was best stated by John C. Nemiah, M.D., in "Psychological Aspects of the Injured," *Trial Magazine*, March–April 1971.

> It should be appreciated by all concerned that the adversary nature of a tort or compensation action subsequent to injury heightens the patient's sense of grievance, entitlement to redress, and revenge—which tends to foster his aggressive drives and to shift his attention away from goals or rehabilitation and eventual regained independence. . . . Finally, it should be recognized that the delays so frequently encountered in settling personal injury litigation tend to keep the patient trapped for months, even years, in a limbo of indecision and idleness in which dependency needs are fostered. During this time it frequently becomes so pointless to try to work toward rehabilitation that, practically, the patient remains an invalid until legal elements emanating from his injury are resolved.

One advantage of Michigan's no-fault system is that injured persons have their medical costs and most of their wage loss taken care of as those costs occur. Rehabilitation is encouraged and paid for as soon as possible after the accident thereby assuring better results and cutting costs. In the nine week trial of the *Shavers*[2] case, many witnesses testified that first payments were made days after an injury was reported, instead of after a long waiting period. Apparently Mr. Wenck is very concerned that medical costs be paid in full and wage losses indexed. Would he prefer a system where the seriously injured would be told that only part of the wage loss or only part of the medical costs were taken care of?

The Essential Insurance Act did eliminate an insurance problem common before the legislation was adopted. Subjective underwriting, the establishing of rates based on factors such as appearance, has been eliminated. Rates are established for classes of risk, filed with the Insurance Bureau, and must be adhered to by insurance companies.

Neither the No-Fault Automobile Insurance Law nor the the Essential Insurance Act set the premiums to be charged by insurance companies. Companies may file rates with the Insurance Bureau, wait for approval, then charge customers the approved rate. Or an insurance company may file rates with the bureau and notify a customer at the same time that rates will change after a set period of time, say thirty days. Under this "file and use" system, the customer's money is refunded if the rate is not approved. Insurance Bureau data indicates that the consumer pays slightly lower rates under "file and use" as compared to "prior approval" of rates.

The question of classification can have philosophical and practical arguments which go on forever. An actuary can show that certain classifications are more likely to have accidents than others. The individual involved may respond that using averages is comparable to the person with his head in the oven and his feet in the refrigerator, who on the average was quite comfortable. The difficult question here is into how many categories can people be divided. Theoretically there could be one insurance rate for everybody, or such a refinement of classifications that there was a different rate for each insured. Michigan law and practice attempts a classification that is a balance between those two extremes.

Another superficial analysis by Mr. Wenck is his comment on removing vehicular property damage from tort liability. There are arguments on both sides of this

*(Continued on page 6)*

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Student Assistant

# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 40.3 | 41.6 | 40.7 (July) |
| Average weekly hours, U.S. | 39.6 | 39.3 | 38.9 (July) |
| Average hourly earnings, Michigan ($) | 10.52 | 11.42 | 11.41 (July) |
| Average hourly earnings, U.S. ($) | 8.02 | 8.50 | 8.55 (July) |
| U.S. motor vehicle production (units) | 637,495 | 779,590 | 609,594 (July) |
| Michigan electricity usage (mil. kwh.): | | | |
| Industrial (mil. kwh.) | 2,644 | 2,445 | 2,348 (April) |
| Residential (mil. kwh.) | 1,663 | 1,813 | 1,709 (April) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 792 | 570 | 597 (July) |
| United States (000 net tons) | 10,159 | 6,050 | 5,719 (July) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 283.1 | 289.1 | 292.4 (July) |
| United States | 274.4 | 290.6 | 292.2 (July) |
| U.S. producer price index (1967 = 100) | 296.0 | 299.4 | 300.6 (July) |
| Michigan farm prices received index (1977 = 100) | 131 | 127 | 120 (Aug.) |

Sources: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

# Contracts for Future Building, First 7 Months: 1981 and 1982

(Thousands of Dollars)

| | Nonresidential | | | Residential | | | Total[a] | | |
|---|---|---|---|---|---|---|---|---|---|
| Area | 1981 | 1982 | Percentage Change | 1981 | 1982 | Percentage Change | 1981 | 1982 | Percentage Change |
| Ann Arbor | 38,784 | 41,937 | + 8 | 22,269 | 11,349 | −49 | 61,053 | 53,286 | −13 |
| Battle Creek | 13,251 | 18,256 | + 38 | 9,793 | 5,950 | −39 | 23,044 | 24,206 | + 5 |
| Bay City | 7,851 | 5,280 | − 33 | 4,065 | 5,695 | +40 | 11,916 | 10,975 | − 8 |
| Detroit | 510,629 | 240,227 | − 53 | 230,865 | 136,559 | −41 | 741,494 | 376,786 | −49 |
| Flint | 24,548 | 12,512 | − 49 | 21,432 | 18,064 | −16 | 45,980 | 30,576 | −34 |
| Grand Rapids | 41,169 | 37,654 | − 9 | 74,987 | 47,068 | −37 | 116,156 | 84,722 | −27 |
| Jackson | 11,443 | 4,878 | − 57 | 11,182 | 4,491 | −60 | 22,625 | 9,369 | −59 |
| Kalamazoo-Portage | 27,908 | 61,965 | +122 | 46,775 | 18,848 | −60 | 74,683 | 80,813 | + 8 |
| Lansing-East Lansing | 32,186 | 16,618 | − 48 | 72,951 | 20,955 | −71 | 105,137 | 37,573 | −64 |
| Muskegon-Norton Shores-Muskegon Heights | 7,306 | 9,390 | + 29 | 16,542 | 10,195 | −38 | 23,848 | 19,585 | −18 |
| Saginaw | 8,042 | 15,085 | + 88 | 16,784 | 7,366 | −56 | 24,826 | 22,451 | −10 |
| Toledo | 116,610 | 56,842 | − 51 | 99,133 | 46,083 | −54 | 215,743 | 102,925 | −52 |
| Michigan | 849,709 | 533,970 | − 37 | 735,070 | 443,957 | −40 | 1,584,779 | 977,927 | −38 |
| United States | 34,840,400 | 32,002,300 | − 8 | 38,485,400 | 30,831,400 | −20 | 73,325,800 | 62,833,700 | −14 |

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

Note: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing-East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; Muskegon-Norton Shores-Muskegon Heights includes Muskegon and Oceana counties; and Toledo includes Monroe County, Michigan, and Fulton, Lucas, Ottawa, and Wood counties, Ohio.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1981 and 1982 figures for nonbuilding construction contracts were $561,171,000 and $357,470,000 respectively, or a decrease of 36 percent. For the United States they were $19,965,400,000 and $20,514,800,000 respectively or an increase of 3 percent. Total building and nonbuilding construction contracts declined by 38 percent in Michigan and 11 percent nationwide.

# Year-to-Year Change in Selected Economic Indicators

| | Percentage change from previous year | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | | | | | | 1982 | | | | | | |
| Indicator | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July |
| **Civilian Employment** | | | | | | | | | | | | | |
| United States | + 1.9 | + 1.9 | + 1.1 | + 1.0 | + 0.7 | 0 | − 0.3 | − 0.5 | − 0.9 | − 1.5 | − 0.9 | − 0.7 | − 1.1 |
| Michigan | + 3.8 | + 2.8 | + 1.7 | + 1.9 | + 1.4 | − 2.5 | − 2.1 | − 1.0 | − 3.4 | − 5.0 | − 3.5 | − 5.0 | − 3.0 |
| Detroit area SMSA[a] | + 2.4 | + 1.2 | + 0.8 | + 0.6 | + 0.6 | − 3.7 | − 3.0 | − 2.2 | − 4.3 | − 5.8 | − 4.2 | − 5.8 | − 4.1 |
| Outstate[b] | + 5.1 | + 4.2 | + 2.5 | + 2.9 | + 2.1 | − 1.5 | − 1.3 | − 0.1 | − 2.7 | − 4.4 | − 2.9 | − 4.4 | − 2.1 |
| **Wage and Salary Jobs[c]** | | | | | | | | | | | | | |
| United States | + 1.9 | + 1.5 | + 1.4 | + 1.1 | + 0.5 | − 0.1 | − 0.5 | − 0.5 | − 0.8 | − 1.1 | − 1.1 | − 1.4 | − 1.7 |
| Michigan | + 0.3 | − 0.7 | + 0.3 | − 1.9 | − 2.9 | − 4.3 | − 4.4 | − 4.0 | − 4.5 | − 5.4 | − 5.1 | − 5.0 | − 5.1 |
| Detroit area SMSA[a] | − 0.6 | − 1.6 | − 0.7 | − 2.6 | − 3.5 | − 5.0 | − 4.7 | − 4.7 | − 4.8 | − 5.7 | − 5.5 | − 6.0 | − 5.3 |
| Outstate[b] | + 1.2 | + 0.1 | + 1.2 | − 1.2 | − 2.3 | − 3.6 | − 4.1 | − 3.3 | − 4.1 | − 5.1 | − 4.8 | − 4.1 | − 4.9 |
| **Average Workweek[d]** | | | | | | | | | | | | | |
| United States | + 2.1 | + 1.3 | − 0.8 | − 0.3 | − 1.2 | − 2.2 | − 7.0 | − 0.8 | − 2.0 | − 2.5 | − 2.7 | − 2.5 | − 1.8 |
| Michigan | + 3.3 | + 3.0 | − 3.5 | − 1.5 | − 2.7 | − 4.3 | −10.5 | + 2.3 | − 2.9 | − 1.0 | − 2.2 | − 0.5 | + 1.0 |
| **Average Weekly Earnings[e]** | | | | | | | | | | | | | |
| United States | +12.3 | +11.2 | + 9.0 | + 8.5 | + 6.6 | + 5.0 | + 1.3 | + 6.8 | + 5.0 | + 4.2 | + 3.8 | + 4.1 | + 4.7 |
| Michigan | +14.7 | +15.0 | + 6.9 | + 7.5 | + 5.9 | + 2.7 | + 1.9 | +11.0 | + 5.2 | + 7.2 | + 5.6 | + 7.4 | + 9.6 |
| **Motor Vehicle Assembly** | | | | | | | | | | | | | |
| United States | +25.6 | +25.4 | −12.4 | −18.4 | −24.6 | −24.2 | −33.1 | −23.7 | −15.7 | −16.2 | −14.3 | −12.7 | − 3.5 |
| Michigan | +73.9 | +53.5 | + 7.3 | − 3.5 | −13.6 | −20.4 | −19.4 | − 8.3 | − 6.9 | − 4.3 | − 6.9 | − 4.8 | + 4.4 |
| General Motors | +45.5 | +29.8 | + 7.5 | + 4.3 | − 6.2 | − 9.7 | −16.3 | + 3.1 | −12.3 | −12.1 | −14.4 | + 1.3 | +15.6 |
| Ford | +99.9 | +59.3 | +14.1 | −10.5 | −30.7 | −53.7 | −46.0 | −19.5 | + 9.2 | +16.8 | +19.5 | − 6.6 | − 1.0 |
| Chrysler | +711.6 | +255.6 | − 9.9 | −22.8 | −11.8 | −12.7 | +20.2 | −44.5 | − 6.8 | − 0.8 | −13.5 | −30.0 | −43.6 |
| **Steel Tonnage Poured** | | | | | | | | | | | | | |
| United States | +49.5 | +44.2 | +23.8 | − 4.7 | −20.8 | −24.6 | −26.9 | −28.4 | −31.5 | −37.9 | −41.3 | −42.1 | −43.7 |
| Michigan | +81.2 | +75.7 | +25.3 | −21.4 | −22.4 | −13.3 | −35.1 | −35.8 | −34.2 | −25.8 | −21.7 | −23.3 | −24.6 |
| **Commercial Electricity Consumption** | | | | | | | | | | | | | |
| United States | + 5.1 | + 0.3 | − 0.3 | + 1.7 | + 2.1 | + 2.3 | + 4.0 | + 5.1 | + 5.5 | + 5.6 | | | |
| Michigan | + 4.5 | + 1.1 | − 0.2 | − 1.9 | − 2.6 | 0 | − 2.8 | + 4.0 | − 0.8 | + 1.9 | | | |
| **Industrial Electricity Consumption** | | | | | | | | | | | | | |
| United States | + 9.4 | + 6.9 | + 2.0 | − 0.4 | − 2.2 | − 6.4 | − 6.2 | − 6.9 | − 6.0 | − 7.9 | | | |
| Michigan | +13.2 | + 8.1 | − 0.8 | − 9.7 | − 7.6 | −19.4 | −10.7 | −17.2 | − 9.6 | −11.2 | | | |
| **Nonresidential Construction Contracts** | | | | | | | | | | | | | |
| United States | | | | | | | | | | −16 | −15 | +10 | −10 |
| Michigan | −33 | +16 | −11 | −38 | −76 | −52 | −24 | −52 | −14 | −55 | −62 | +30 | −37 |
| **Residential Construction Contracts** | | | | | | | | | | | | | |
| United States | | | | | | | | | | −15 | −29 | − 5 | −12 |
| Michigan | −22 | −40 | −36 | −47 | −60 | −53 | −44 | −58 | −47 | −42 | −36 | −29 | −40 |
| **Nonbuilding Construction** | | | | | | | | | | | | | |
| United States | | | | | | | | | | + 8 | + 5 | + 8 | + 7 |
| Michigan | − 9 | − 3 | +32 | − 8 | −17 | + 9 | + 7 | −52 | −37 | −72 | − 1 | −23 | −36 |
| **Retail Sales** | | | | | | | | | | | | | |
| United States | +11.1 | + 9.5 | +10.9 | + 6.3 | + 4.7 | + 5.7 | + 0.2 | + 2.7 | + 2.6 | + 2.6 | + 3.8 | + 1.1 | |
| Michigan | + 5.4 | + 5.4 | + 7.3 | + 1.3 | + 0 | + 0.5 | −11.2 | − 6.3 | − 5.7 | − 5.3 | + 0.3 | − 4.2 | |
| Detroit Area[a] | + 3.6 | + 2.3 | + 4.3 | − 1.6 | − 2.6 | − 3.9 | −17.2 | −13.6 | −14.3 | −14.6 | − 8.3 | − 9.7 | |
| Outstate[b] | + 7.3 | + 8.8 | +10.5 | + 4.9 | + 2.9 | + 5.7 | − 4.2 | + 2.2 | + 4.2 | + 5.7 | + 9.9 | + 1.2 | |
| **Consumer Price Index** | | | | | | | | | | | | | |
| United States | +10.7 | +10.9 | +11.0 | +10.2 | + 9.6 | + 8.9 | + 8.4 | + 7.7 | + 6.8 | + 6.6 | + 6.7 | + 7.1 | + 6.3 |
| Detroit[a] | +11.6 | +11.1 | + 9.5 | + 6.5 | + 5.0 | + 3.2 | + 4.6 | + 2.8 | + 3.7 | + 4.1 | + 3.9 | + 3.1 | + 3.3 |

Source: Michigan Employment Security Commission, special release; Bureau of Labor Statistics, *The Employment Situation* (monthly); Motor Vehicle Manufacturers Association, special release; American Iron and Steel Institute, special release; Energy Information Administration, special release; F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases (monthly); and Bureau of the Census, *Monthly Retail Trade.*

a. Wayne, Oakland, Macomb, Livingston, Lapeer, and St. Clair counties.
b. Michigan minus Detroit area.
c. The number of wage and salary jobs, except agricultural, reported by employers.
d. Average hours worked by manufacturing production workers.
e. Average earnings among manufacturing production workers.

## MICHIGAN'S ESSENTIAL INSURANCE AND NO-FAULT LAWS: A CRITIQUE

*(Continued from page 3)*

question. However, the average individual is better off having the option to insure his own car regardless of the cause of the physical damage than being liable for the possible risk of property damage to another's car. For example, if I have a car worth $2,000, I can decide not to insure it or have a deductible and know that my maximum risk is $2,000. Under the old tort liability system, I could have an undetermined liability dependent on the value of the car involved in an accident with me.

Mr. Wenck constantly uses the word socialism without defining it. A professor at Michigan State University is paid by the taxpayers, which, as implied from his discussion, is socialistic. It wasn't many decades ago that those who advocated free public education were called socialists.

The National Conference of Commissioners on Uniform State Laws (San Francisco, 1972) approved the Uniform Motor Vehicle Accident Reparations Act, commonly called no-fault automobile insurance. The federal Department of Transportation has consistently supported no-fault automobile insurance. The governor of Michigan, a bipartisan majority of legislators, the Insurance Bureau, as well as a large section of insurance companies such as the American Insurance Association, consumers groups, and many labor organizations all supported the passage of Michigan's no-fault law. These well-known supporters of no-fault are not known as socialists trying to undermine the American economy.

Yes, there is room for improvement in Michigan's no-fault and essential insurance laws. Practical experience with any laws develops amendatory improvements. Continued improvement will come about as the insurance industry, consumers' groups, legislators, regulatory bodies and the general public work together towards improvement for the future—not try to revert to the old tort system.

### FOOTNOTES

1. See Alfred F. Conrad, *Automobile Accident Costs and Payments: Studies in the Economics of Injury Reparation* (Ann Arbor: University of Michigan Press, 1964); Robert E. Keeton, *Basic Protection for the Traffic Victim* (Boston: Little, Brown and Co., 1965); Jeffrey O'Connell, *Ending Insult to Injury* (Urbana: University of Illinois Press, 1975); Uniform Motor Vehicle Accident Reparations Act, drafted by the National Conference of Commissioners on Uniform State Laws (San Francisco, Cal., 1972).
2. Shavers v. Attorney General, 402 Mich 554 (1978).

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## EXPORT UPDATE

*(Continued from page 2)*

percent of all manufacturing employment in the state. Five states were higher: California (314,500), Ohio (199,800), New York (189,100), Pennsylvania (184,400), and Illinois (176,200). Michigan's rank in jobs is below its rank in manufactured exports because of relatively higher output and pay per worker in the automotive sector.

The input-output procedure also was used to estimate the requirements from the nonmanufacturing sector of the nation's economy and, from that, the effect on jobs in each state. California was the leader (124,100), followed by New York (92,400), Illinois (80,800), Ohio (78,000), Texas (75,900), Pennsylvania (75,200), and Michigan (61,800). In Michigan, 17,000 of the nonfactory jobs created by manufactured exports were in business services; 23,100 in wholesale and retail trade; 15,600 in transportation, communication, and public utilities; and 23,200 in mining, agriculture, and other industries (See Table 1).

### DEVELOPMENTS SINCE 1980

When 1981 export origin figures are released in February or March of 1983, they will reveal an increase of at least 8 percent in the dollar value of motor vehicle exports from Michigan, primarily a result of shipments of passenger cars and light trucks to Canada. Parts exports to Canada will probably have increased at a rate better than 15 percent. Thus, even assuming employment from nonautomotive exports did not change, vehicle exports produced a total export employment gain of 3 percent to a 1981 total of 244,000 jobs.

Export origin data for 1982 will not be collected and tabulated by the census bureau. If these data were available about a year-and-a-half from now, they would reveal a precipitous decline in Michigan's motor vehicle exports and a modest increase in parts exports to Canada. These judgments are based on data from the Motor Vehicle Manufacturers Association in Detroit and the Department of Commerce in Washington. The decline in Michigan's direct and indirect manufactured shipments between 1981 and 1982 was 20 percent, in dollars not adjusted for price inflation. The decline in civilian employment directly and indirectly related to manufactured

**TABLE 2**

**Top Ten States in Value of Export-Related Manufacturers' Shipments: 1980**

**Value of manufacturers' shipments**

| State | Direct[a] | Supporting[b] | Total | Percentage[c] |
|---|---|---|---|---|
| California | 16,529.8 | 8,649.2 | 25,179.0 | 14.2 |
| Texas | 10,492.1 | 9,334.8 | 19,826.9 | 12.3 |
| Ohio | 10,406.4 | 7,757.7 | 18,164.1 | 15.9 |
| Illinois | 10,244.5 | 6,686.5 | 16,931.0 | 14.1 |
| New York | 9,168.2 | 5,979.6 | 15,147.8 | 13.5 |
| Pennsylvania | 7,579.9 | 7,436.6 | 15,016.5 | 13.8 |
| Michigan | 8,816.9 | 5,438.4 | 14,255.3 | 15.3 |
| Washington | 8,738.3 | 1,781.2 | 10,519.5 | 29.6 |
| Indiana | 4,652.6 | 4,479.5 | 9,132.1 | 14.3 |
| New Jersey | 4,408.9 | 3,976.2 | 8,385.1 | 12.2 |
| TOTAL U.S. | 155,103.3 | 105,843.3 | 260,946.6 | 14.1 |

SOURCE: Bureau of the Census, *Annual Survey of Manufactures* 1980, *Origin of Exports of Manufactured Products* (Washington, D.C.: 1982), M80 (AS)-6, Table 3a.

a. Includes only the value of manufactured products exported by the producing plants or their agents.

b. Includes components, parts, supplies, and so forth, shipped from other plants and incorporated into the products shipped to other countries by the plants from which the exports originated.

c. Total exports as a percentage of total manufacturers' shipments.

exports was 15 percent or over 35,000 jobs. Michigan's civilian employment related to manufactured exports now stands about 15,000 above the 1977 figure of 194,500. Blame can be placed on the extremely depressed condition of the Canadian economy and sharp inroads being made there by Japanese vehicle manufacturers.

Canada has been a very lucrative market for Michigan since the Canadian automotive agreement was initiated in the mid-1960s. When Canada again prospers—probably not in 1983 but quite likely in 1984—that market very likely will flourish again, although not enough to recoup those 35,000 jobs lost since 1981. Productivity will have raised the output/labor ratio by then. Michigan will have to regain its competitive edge in other industries.

## APPENDIX

Automobile production in Canada is dominated by the Canadian subsidiaries or associates of the companies which dominate the industry on this side of the border, so that in substance there is a North American automobile industry. It produces for a North American automobile market characterized by similar taste distributions on both sides of the Canadian-American border.

Until 1965, the United States government levied tariffs of 6.5 percent ad valorum on imported new automobiles and 8.5 percent ad valorum on automobile parts manufactured outside of the country. The Canadian government, in addition to tariffs of 17.5 percent and 25 percent respectively on most vehicles and parts, employed a device known as content requirement on new motor vehicles produced in that country. Vehicle manufacturers whose product embodied a commonwealth-produced value of at least 60 percent were allowed to import certain components, ordinarily subject to tariff, duty free. Meeting this 60 percent requirement also entitled a manufacturer to preferential tariff treatment in other commonwealth countries, enhancing his export potential for vehicles produced in Canada. In other words the content requirement was an inducement for motor vehicle manufacturers in Canada to manufacture or purchase parts locally.

Automobile trade conditions between Canada and the United States were altered radically in 1965. In return for promises of substantial production increases, automobile manufacturers in Canada were given the privilege of duty free importation of motor vehicles and original parts from the United States. The elimination of United States tariffs with respect to motor vehicles and original parts manufactured in Canada gave Canadian producers free access to the American market. As a consequence of the elimination of trade barriers, traffic in these products between our two countries rose from a level of about $700 million in 1964 to nearly $3.3 billion during 1967. The 1981 figure was $22.3 billion. This expansion has enabled manufacturers to integrate their entire North American operation, rationalizing the production of vehicles and parts; the industry has achieved efficiencies in manufacturing that would not have been attainable under pre-1965 conditions.

The agreement pertains to the manufacture and sale of new automobiles and specified other motor vehicles, including most trucks and buses, and original parts for these vehicles. It does not apply to tires and tubes, except those already mounted on an assembled vehicle, or to replacement parts. Furthermore, only certain companies are permitted to import motor vehicles and parts duty free. In Canada, these motor vehicle manufacturers are qualified on the basis of their production records in the base year (August 1, 1963–July 31, 1964). In order to qualify, a producer had to maintain the dollar value of production in the base year as well as his Canadian ratio of production of sales. Independent parts producers must work through one of these qualified manufacturers in order to import duty free parts for subassemblies or other reasons.

The history of United States-Canada automotive trade since the agreement is encapsulated in the following table.

**TABLE 3**

**United States-Canada Trade in Automotive Products: 1964–1982**

(millions of U.S. dollars)

| | Canadian imports[1] | | | U.S. imports[2] | | |
|---|---|---|---|---|---|---|
| Year | Vehicles | Parts | Total | Vehicles | Parts | Total |
| 1964 | 57 | 577 | 634 | 22 | 49 | 71 |
| 1965 | 142 | 738 | 880 | 88 | 139 | 227 |
| 1966 | 356 | 1,011 | 1,367 | 451 | 360 | 811 |
| 1967 | 666 | 1,216 | 1,882 | 920 | 474 | 1,394 |
| 1968 | 923 | 1,684 | 2,607 | 1,483 | 783 | 2,266 |
| 1969 | 976 | 2,134 | 3,110 | 2,097 | 959 | 3,056 |
| 1970 | 894 | 2,019 | 2,913 | 2,038 | 1,080 | 3,118 |
| 1971 | 1,319 | 2,448 | 3,767 | 2,511 | 1,481 | 3,992 |
| 1972 | 1,579 | 2,866 | 4,445 | 2,778 | 1,795 | 4,573 |
| 1973 | 2,082 | 3,552 | 5,634 | 3,061 | 2,172 | 5,233 |
| 1974 | 2,573 | 3,980 | 6,554 | 3,482 | 1,997 | 5,479 |
| 1975 | 3,064 | 4,409 | 7,472 | 3,726 | 2,008 | 5,734 |
| 1976 | 3,339 | 5,550 | 8,889 | 4,840 | 2,983 | 7,823 |
| 1977 | 3,712 | 6,434 | 10,146 | 5,636 | 3,496 | 9,132 |
| 1978 | 3,771 | 7,080 | 10,851 | 6,165 | 4,160 | 10,326 |
| 1979 | 4,801 | 7,344 | 12,145 | 5,685 | 3,831 | 9,715 |
| 1980 | 3,950 | 6,478 | 10,428 | 5,695 | 2,888 | 8,583 |
| 1981 | 4,218 | 7,700 | 11,918 | 6,917 | 3,462 | 10,379 |
| 1981[3] | 1,944 | 3,088 | 5,032 | 2,631 | 1,405 | 4,036 |
| 1982[3] | 1,407 | 3,429 | 4,836 | 3,858 | 1,520 | 5,378 |

SOURCE: U.S. Department of Commerce, special release.

1. Canadian import statistics from U.S., based on FAS or transaction values, converted to U.S. dollars on the basis of then prevailing exchange rates.
2. U.S. imports from Canada are FAS or transaction values as published by the Bureau of the Census.
3. First five months.

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# COPING WITH JOB STRESS

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This paper is a condensed version of a paper that was presented at the *42nd Annual Meeting of the Academy of Management at New York,* August 15–18, 1982. The paper has been modified to meet the style requirements of *The Michigan Economy.* Details of the measures used, the statistical techniques applied, and results of data analysis are available from the author.

Recent literature in the field of organizational stress (Cooper and Marshall, 1977; Beehr and Newman, 1978; Van Sell, Brief, and Schuler, 1981) has documented the deleterious consequences of various job stressors , particularly role conflict, role ambiguity, and role overload, for both the individual and the organization. Among the most frequently reported outcomes of these role-based stressors are job dissatisfaction, job-related tension, job-related threat, job-induced anxiety, propensity to leave, and voluntary turnover. Although a variety of stress-reducing mechanisms have been suggested in the popular literature, "very few of the purported strategies for handling job stress have been evaluated with any sort of scientific rigor" (Newman and Beehr, 1979, p. 3). The purpose of this study was to identify and measure the coping strategies used by managers in response to various stressors encountered in the organizational setting.

Previous research (Burke and Belcourt, 1974; Cooper and Marshall, 1977; Dohrenwend, 1961) suggests that not all coping behaviors are functional and that individuals may exhibit both adaptive and maladaptive responses in their effort to vitiate or manage stress. The study therefore distinguished between adaptive and maladaptitve coping behaviors. Based on the two-fold classification of coping behaviors proposed by Kahn and his associates (Kahn, Wolfe, Quinn, Snoek, and Rosenthal, 1964), adaptive coping can be described as problem-solving approaches aimed at dealing directly with the stressful situation by seeking and implementing solutions. Conversely, maladaptive coping represents emotional or defensive, self-protective approaches to dealing with stressful work experiences. Recognizing the possibility that the internal resources and ability of individuals to deal with stressful situations may differ (Pearlin and Schooler, 1978), an additional focus of this study was on assessing the influence of managers' personal and demographic characteristics on their reactions to job-related stressors.

## RESEARCH METHOD

Data for this study were collected by means of questionnaires sent out by company mail to a random sample of 300 first level managers employed at a large utility company in the Midwest. Completed questionnaires were returned directly to the researcher by 205 persons, representing a response rate of 68 percent. Of the respondents, 54 percent were male, 46 percent female. The average age of the respondents was 39.6 years. The mean organizational tenure of the subjects was 16.7 years.

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*Job Stressors.* Five stressors were examined in this study: (1) role conflict, which refers to incompatible expectations associated with the job role; (2) role ambiguity, or lack of clarity regarding role expectations; (3) quantitatitve overload, or excessive volume of work; (4) qualitatitve overload, which refers to perceived pressure for quality and difficulty in reaching performance standards; and (5) interunit conflict, which reflects lack of cooperation and communication difficulties between departments.

*Stress Reactions.* The study investigated two types of reactions to the five job stressors, affective and behavioral. Felt stress represented the psychological response state of disturbed affect in relation to job stressors. Coping behaviors were defined as an array of overt behaviors by which an individual actively seeks to alleviate or respond to stressful conditions at work. The measures of adaptive and maladaptive coping behaviors were developed from responses to an open-ended questionnaire which asked individuals to generate a list of possible behaviors when faced with stressful working conditions. A group of twenty persons who were not part of the original subject pool generated a total of 176 unique items. A panel of twelve judges who were familiar with work organizations sorted the responses into specified categories.

The category of adaptitve coping behaviors consisted of thirty-three items and included such behaviors as planning, organizing, and prioritizing assignments; enlisting the support of others with organizational power; touching base with the superior and co-workers concerning projects in progress; requesting needed resources; making better use of clerical support; changing approaches when the cooperation of others is needed; and reading up on better ways of accomplishing work. Maladaptive coping behaviors included twenty-nine items: e.g., working harder but making more mistakes; making promises that cannot be kept; sticking to a single solution to problems; trying to do two things at once; holding back information from others; avoiding the supervisor or co-workers; telling the superior one is overloaded and "something must give"; and leaving the work place. Respondents were asked to check each behavior that they had used within the last two months to deal with stressful situations. The sum of the checked items within each category was used as a measure of the extent to which an individual exhibited adaptive and maladaptive coping behaviors. The personal characteristics investigated as possible moderators of managers' stress reactions were sex, organizational tenure, and trait anxiety, which reflects an individual's predisposition to be anxious and nervous.

## RESULTS OF RESEARCH

Simple and partial correlational analyses were performed to determine the pattern of relationships among the variables investigated in the study.

The results of this research substantiated previous findings and provided additional evidence concerning the aversive personal outcomes associated with stressors at work in terms of felt or experienced stress. All five stressors were positively related to felt stress. Role conflict and quantitative overload were found to be more strongly related to felt stress than role ambiguity and qualitative overload respectively. The study extended stress research by identifying coping behaviors exhibited by managers in dealing with stressors encountered in the work place. The results confirmed the expectation that maladaptive coping behaviors would be positively and more strongly related to job stressors than adaptive coping behaviors. The data indicated that high levels of role conflict, role ambiguity, and quantitative or qualitative overload elicit more maladaptive coping behaviors than adaptive behaviors. It appears that when stressor conditions are low, individuals do not engage in active coping. When stressor conditions increase in strength, individuals react to alleviate the situation and respond with both adaptive and maladaptive behaviors, but the dysfunctional behaviors tend to dominate. Consistent with expectations, felt stress was found to be positively associated with maladaptive coping. Thus, the greater the extent of maladaptive behaviors engaged in by the manager, the greater the degree of experienced stress. The results did not demonstrate the expected inverse relationship between adaptive coping and felt stress. This suggests that adaptive coping may serve to neutralize felt stress but not reduce it.

With regard to personal variables, the results indicated that sex of the manager was unrelated to both felt stress and maladaptive coping but was weakly related to adaptive coping. The data showed a slight tendency for female managers to engage in more adaptive coping than male managers, a finding that tends to disconfirm the popular stereotype that women managers are too emotional and are unable to cope with the pressures inherent in the managerial role (Basil, 1973). Organizational tenure was found to be inversely related to felt stress and maladaptive coping. This tends to confirm McGrath's (1976) proposition that past experience affects the level of subjectively experienced stress and modifies reactions to it. The results indicate the role of learning and knowledge of the system in avoiding maladaptive behaviors when dealing with work-related stressors. The finding that organizational tenure was also negatively related to adaptive coping was unexpected. A possible explanation for this is that adaptive behaviors are learned through a trial and error process, and individuals may not have learned the appropriate responses for dealing with new and unfamiliar situations.

The role of trait anxiety in increasing an individual's vulnerability to stress was demonstrated by its strong positive relationship with both felt stress and maladaptive coping behaviors. The positive relationship between trait anxiety and adaptive coping suggests that anxiety about role performance prompts individuals to respond in some way to ameliorate stressful conditions; some of these behaviors turn out to be adaptive, but more are maladaptive in nature.

The results of the partial correlation analysis provided little evidence concerning the moderating influence of personal characteristics. Of the three personal variables

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# Brief

## POVERTY IN DETROIT

More than one in four of Detroit's population subsisted below the poverty threshold in 1980, according to figures published recently by the Bureau of the Census. The incidence of poverty in the Motor City was more than double the 1978 rate. Among the five United States cities for which annual poverty data are published, Detroit climbed from last to first place in the rate of poverty between 1978 and 1980.

| City | 1978 | 1979 | 1980 |
|---|---|---|---|
| Detroit | 12.1 | 18.1 | 28.6 |
| Los Angeles-Long Beach | 12.4 | 13.7 | 12.0 |
| Chicago | 18.4 | 23.6 | 23.7 |
| New York | 18.7 | 19.3 | 20.9 |
| Philadelphia | 19.8 | 18.3 | 21.3 |

## THE POVERTY THRESHOLD

The official definition of poverty is based on the notion of absolute financial hardship, but, as a practical matter, the poverty line is a multiple of the income needed to purchase an "economy" diet, one that just meets minimum standards of nutrition and diversity. Government studies have shown that for households with three or more individuals the multiple is three, that is, a third of the budget goes for food. In two-person households food absorbs 27 percent of the budget, and for single individuals the ratio is even smaller. The proportion varies because relatively fixed costs, such as utilities, are spread among more people in larger households. In 1969 the poverty level per household translated into thresholds of $4,284 (single-person), $5,514 (two-person), and $6,442 (three-person). Thresholds also vary according to farm or nonfarm residence, because farmers have advantages such as home-grown, fresh vegetables and eggs. For example, the poverty line for a four-member farm family was $6,958 compared with one of $8,183 for a four-person nonfarm family. The same poverty thresholds apply in every region, despite differences in the cost of living. The statistical net catches the cases of unremitting poverty, and it snags those involving voluntary poverty and instances of temporary financial distress. It misses those whose incomes are above the poverty line but who experience poverty in the relative sense: middle-income families who sense inferiority to the Joneses.

On the basis of the cash criterion, about twenty-nine million Americans were poor in 1980. In Detroit, nearly 350,000 people lived in households where incomes were below the poverty line. In the region surrounding the city, over 200,000 individuals, about one in fourteen of the total population, were in this category (see Table 1). Poverty rates for the Detroit area and the nation's other large metropolitan areas are shown in Table 2.

The Current Population Survey, conducted in March of each year, is the source of income data used to develop the information on poverty for the nation, its geographic regions, and its twenty largest metropolitan areas. The March 1981 CPS was conducted among 65,500 households selected to be representative of the population as a whole. Sampling variability is associated with each of the numbers developed from the CPS, that is, a canvass of all households might have produced different statistics. Thus, these data should be interpreted as suggesting trends and not as precise measurements.

### TABLE 1

### Poverty among Persons and Families in the Detroit Standard Metropolitan Statistical Area and in All U.S. Standard Metropolitan Statistical Areas: 1976–1980

| | Persons | | Families | |
|---|---|---|---|---|
| Item and year | Inside central city | Outside central city | Inside central city | Outside central city |
| | **Detroit SMSA** | | | |
| Number below poverty level (1,000) | | | | |
| 1976 | 249 | 135 | 55 | 28 |
| 1977 | 174 | 142 | 34 | 31 |
| 1978 | 144 | 135 | 28 | 30 |
| 1979 | 233 | 148 | 49 | 31 |
| 1980 | 345 | 205 | 74 | 46 |
| Poverty rate[a] | | | | |
| 1976 | 20.4 | n.a. | 17.7 | n.a. |
| 1977 | 14.7 | 4.9 | 11.8 | 4.0 |
| 1978 | 12.1 | 4.5 | 9.1 | 3.8 |
| 1979 | 18.8 | 4.8 | 15.6 | 3.7 |
| 1980 | 28.6 | 6.9 | 26.2 | 5.7 |
| | **All U.S. SMSAs** | | | |
| Number below poverty level (1,000) | | | | |
| 1976 | 9,482 | 5,747 | 1,961 | 1,276 |
| 1977 | 9,203 | 5,657 | 1,925 | 1,216 |
| 1978 | 9,285 | 5,805 | 1,983 | 1,222 |
| 1979 | 9,500 | 6,232 | 1,970 | 1,261 |
| 1980 | 10,644 | 7,377 | 2,214 | 1,578 |
| Poverty rate[a] | | | | |
| 1976 | 15.8 | 6.9 | 12.6 | 5.7 |
| 1977 | 15.4 | 6.8 | 12.5 | 5.4 |
| 1978 | 15.4 | 6.8 | 12.7 | 5.3 |
| 1979 | 15.7 | 7.2 | 12.7 | 5.4 |
| 1980 | 17.2 | 8.2 | 14.0 | 6.5 |

SOURCE: U.S. Department of Commerce, Bureau of the Census, **Current Population Reports**, Series P-60, no. 133, (Washington, D.C.: annually), and similar reports for 1976 1979.

a. Number below poverty level as a percentage of total population or number of families.

## INCOME SIZE DISTRIBUTION

Income size distribution data from the CPS are reproduced in Table 3. These figures point to a sharp decline in Detroit households earning $15,000 to $25,000 per year, a sharp increase in those earning less than $10,000, and some increase in those earning over $25,000. Largely these data reflect the loss of middle-income factory jobs at Chrysler Corporation and the spin-off effects on other industries. Detroit experienced considerably more downward than upward income mobility, and that phenomenon produced a much sharper

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# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 40.6 | 40.7 | 40.1 (Aug.) |
| Average weekly hours, U.S. | 39.9 | 39.0 | 39.0 (Aug.) |
| Average hourly earnings, Michigan ($) | 10.50 | 11.40 | 11.21 (Aug.) |
| Average hourly earnings, U.S. ($) | 8.03 | 8.55 | 8.51 (Aug.) |
| U.S. motor vehicle production (units) | 497,677 | 615,181 | 504,472 (Aug.) |
| Michigan electricity usage (mil. kwh.): | | | |
| Industrial (mil. kwh.) | 2,648 | 2,348 | 2,415 (May) |
| Residential (mil. kwh.) | 1,596 | 1,709 | 1,510 (May) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 794 | 597 | 550 (Aug.) |
| United States (000 net tons) | 10,120 | 5,719 | 5,538 (Aug.) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 283.5 | 292.4 | 292.7 (Aug.) |
| United States | 276.5 | 292.2 | 292.8 (Aug.) |
| U.S. producer price index (1967 = 100) | 295.5 | 300.6 | 299.5 (Sep.) |
| Michigan farm prices received index (1977 = 100) | 131 | 127 | 120 (Aug.) |

Sources: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

# Contracts for Future Building, First 8 Months: 1981 and 1982

(Thousands of Dollars)

| Area | Nonresidential | | | Residential | | | Total[a] | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | Percentage Change | 1981 | 1982 | Percentage Change | 1981 | 1982 | Percentage Change |
| Ann Arbor | 43,115 | 45,451 | + 5 | 25,520 | 15,271 | +40 | 68,635 | 60,722 | −12 |
| Battle Creek | 14,100 | 18,789 | + 33 | 10,763 | 7,052 | −34 | 24,863 | 25,841 | + 4 |
| Bay City | 8,371 | 5,500 | − 34 | 4,639 | 6,195 | +34 | 13,010 | 11,695 | −10 |
| Detroit | 562,483 | 314,800 | − 44 | 260,985 | 197,826 | −24 | 823,468 | 512,626 | −38 |
| Flint | 26,101 | 13,538 | − 48 | 24,485 | 20,232 | −17 | 50,586 | 33,770 | −33 |
| Grand Rapids | 87,481 | 58,510 | − 33 | 82,135 | 53,962 | −34 | 169,616 | 112,472 | −34 |
| Jackson | 12,797 | 4,878 | − 62 | 12,113 | 6,960 | −43 | 24,910 | 11,838 | −52 |
| Kalamazoo-Portage | 32,724 | 64,089 | + 99 | 53,061 | 22,083 | −58 | 85,335 | 86,172 | −.010 |
| Lansing-East Lansing | 39,087 | 33,762 | − 14 | 80,705 | 26,197 | −68 | 119,792 | 59,959 | −50 |
| Muskegon-Norton Shores-Muskegon Heights | 7,351 | 16,276 | +121 | 18,607 | 9,317 | −50 | 25,958 | 25,593 | − 1 |
| Saginaw | 9,490 | 15,468 | + 63 | 17,790 | 8,110 | −54 | 27,280 | 23,578 | −14 |
| Toledo | 122,902 | 62,405 | − 49 | 108,960 | 60,990 | −44 | 231,862 | 123,395 | −47 |
| Michigan | 987,130 | 666,151 | − 33 | 838,200 | 565,501 | −33 | 1,825,330 | 1,231,652 | −33 |
| United States | 40,018,300' | 38,060,900 | − 5 | 43,219,100 | 36,403,800 | −16 | 83,237,400 | 74,464,700 | −11 |

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

Note: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing-East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; Muskegon-Norton Shores-Muskegon Heights includes Muskegon and Oceana counties; and Toledo includes Monroe County, Michigan, and Fulton, Lucas, Ottawa, and Wood counties, Ohio.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1981 and 1982 figures for nonbuilding construction contracts were $607,711,000 and $387,734,000 respectively, or a decrease of 36 percent. For the United States they were $22,041,800,000 and $23,514,500,000 respectively or an increase of 7 percent. Total building and nonbuilding construction contracts declined by 33 percent in Michigan and 7 percent nationwide.

# Year-to-Year Change in Selected Economic Indicators

| | Percentage change from previous year | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | | | | | 1982 | | | | | | | |
| Indicator | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. |
| **Civilian Employment** | | | | | | | | | | | | | |
| United States | + 1.9 | + 1.1 | + 1.0 | + 0.7 | 0 | − 0.3 | − 0.5 | − 0.9 | − 1.5 | − 0.9 | − 0.7 | − 1.1 | − 1.0 |
| Michigan | + 2.8 | + 1.7 | + 1.9 | + 1.4 | − 2.5 | − 2.1 | − 1.0 | − 3.4 | − 5.0 | − 3.5 | − 5.0 | − 3.0 | − 4.0 |
| Detroit area SMSA[a] | + 1.2 | + 0.8 | + 0.6 | + 0.6 | − 3.7 | − 3.0 | − 2.2 | − 4.3 | − 5.8 | − 4.2 | − 5.8 | − 4.0 | − 4.6 |
| Outstate[b] | + 4.2 | + 2.5 | + 2.9 | + 2.1 | − 1.5 | − 1.3 | − 0.1 | − 2.7 | − 4.4 | − 2.9 | − 4.4 | − 2.2 | − 3.5 |
| **Wage and Salary Jobs[c]** | | | | | | | | | | | | | |
| United States | + 1.5 | + 1.4 | + 1.1 | + 0.5 | − 0.1 | − 0.5 | − 0.5 | − 0.8 | − 1.1 | − 1.1 | − 1.4 | − 1.7 | − 2.1 |
| Michigan | − 0.7 | + 0.3 | − 1.9 | − 2.9 | − 4.3 | − 4.4 | − 4.0 | − 4.5 | − 5.4 | − 5.1 | − 5.0 | − 5.1 | − 4.2 |
| Detroit area SMSA[a] | − 1.6 | − 0.7 | − 2.6 | − 3.5 | − 5.0 | − 4.7 | − 4.7 | − 4.8 | − 5.7 | − 5.5 | − 6.0 | − 5.3 | − 4.6 |
| Outstate[b] | + 0.1 | + 1.2 | − 1.2 | − 2.3 | − 3.6 | − 4.1 | − 3.3 | − 4.1 | − 5.1 | − 4.8 | − 4.1 | − 4.9 | − 3.9 |
| **Average Workweek[d]** | | | | | | | | | | | | | |
| United States | + 1.3 | − 0.8 | − 0.3 | − 1.2 | − 2.2 | − 7.0 | − 0.8 | − 2.0 | − 2.5 | − 2.7 | − 2.5 | − 1.8 | − 2.3 |
| Michigan | + 3.0 | − 3.5 | − 1.5 | − 2.7 | − 4.3 | −10.5 | + 2.3 | − 2.9 | − 1.0 | − 2.2 | − 0.5 | + 1.0 | − 1.2 |
| **Average Weekly Earnings[e]** | | | | | | | | | | | | | |
| United States | +11.2 | + 9.0 | + 8.5 | + 6.6 | + 5.0 | + 1.3 | + 6.8 | + 5.0 | + 4.2 | + 3.8 | + 4.1 | + 4.7 | + 3.6 |
| Michigan | +15.0 | + 6.9 | + 7.5 | + 5.9 | + 2.7 | + 1.9 | +11.0 | + 5.2 | + 7.2 | + 5.6 | + 7.4 | + 9.6 | + 5.3 |
| **Motor Vehicle Assembly** | | | | | | | | | | | | | |
| United States | +25.4 | −12.4 | −18.4 | −24.6 | −24.2 | −33.1 | −23.7 | −15.7 | −16.2 | −14.3 | −12.7 | − 3.5 | + 1.4 |
| Michigan | +53.5 | + 7.3 | − 3.5 | −13.6 | −20.4 | −19.4 | − 8.3 | − 6.9 | − 4.3 | − 6.9 | − 4.8 | + 4.4 | + 9.2 |
| General Motors | +29.8 | + 7.5 | + 4.3 | − 6.2 | − 9.7 | −16.3 | + 3.1 | −12.3 | −12.1 | −14.4 | + 1.3 | +15.6 | +36.4 |
| Ford | +59.3 | +14.1 | −10.5 | −30.7 | −53.7 | −46.0 | −19.5 | + 9.2 | +16.8 | +19.5 | − 6.6 | − 1.0 | −28.2 |
| Chrysler | +255.6 | − 9.9 | −22.8 | −11.8 | −12.7 | +20.2 | −44.5 | − 6.8 | − 0.8 | −13.5 | −30.0 | −43.6 | + 4.7 |
| **Steel Tonnage Poured** | | | | | | | | | | | | | |
| United States | +44.2 | +23.8 | − 4.7 | −20.8 | −24.6 | −26.9 | −28.4 | −31.5 | −37.9 | −41.3 | −42.1 | −43.7 | −45.3 |
| Michigan | +75.7 | +25.3 | −21.4 | −22.4 | −13.3 | −35.1 | −35.8 | −34.2 | −25.8 | −21.7 | −23.3 | −24.6 | −30.7 |
| **Commercial Electricity Consumption** | | | | | | | | | | | | | |
| United States | + 0.3 | − 0.3 | + 1.7 | + 2.1 | + 2.3 | + 4.0 | + 5.1 | + 5.5 | + 5.6 | + 1.8 | | | |
| Michigan | + 1.1 | − 0.2 | − 1.9 | − 2.6 | 0 | − 2.8 | + 4.0 | − 0.8 | + 1.9 | − .2 | | | |
| **Industrial Electricity Consumption** | | | | | | | | | | | | | |
| United States | + 6.9 | + 2.0 | − 0.4 | − 2.2 | − 6.4 | − 6.2 | − 6.9 | − 6.0 | − 7.9 | − 9.1 | | | |
| Michigan | + 8.1 | − 0.8 | − 9.7 | − 7.6 | −19.4 | −10.7 | −17.2 | − 9.6 | −11.2 | − 8.8 | | | |
| **Nonresidential Construction Contracts** | | | | | | | | | | | | | |
| United States | | | | | | | | | −16 | −15 | +10 | −10 | |
| Michigan | +16 | −11 | −38 | −76 | −52 | −24 | −52 | −14 | −55 | −62 | +30 | −37 | −33 |
| **Residential Construction Contracts** | | | | | | | | | | | | | |
| United States | | | | | | | | | −15 | −29 | − 5 | −12 | +11 |
| Michigan | −40 | −36 | −47 | −60 | −53 | −44 | −58 | −47 | −42 | −36 | −29 | −40 | −33 |
| **Nonbuilding Construction** | | | | | | | | | | | | | |
| United States | | | | | | | | | + 8 | + 5 | + 8 | + 7 | +52 |
| Michigan | − 3 | +32 | − 8 | −17 | + 9 | + 7 | −52 | −37 | −72 | − 1 | −23 | −36 | −36 |
| **Retail Sales** | | | | | | | | | | | | | |
| United States | + 9.5 | +10.9 | + 6.3 | + 4.7 | + 5.7 | + 0.2 | + 2.7 | + 2.6 | + 2.6 | + 3.8 | + 1.1 | + 2.2 | |
| Michigan | + 5.4 | + 7.3 | + 1.3 | + 0 | + 0.5 | −11.2 | − 6.3 | − 5.7 | − 5.3 | + 0.3 | − 4.2 | − 2.8 | |
| Detroit Area[a] | + 2.3 | + 4.3 | − 1.6 | − 2.6 | − 3.9 | −17.2 | −13.6 | −14.3 | −14.6 | − 8.3 | − 9.7 | − 8.1 | |
| Outstate[b] | + 8.8 | +10.5 | + 4.9 | + 2.9 | + 5.7 | − 4.2 | + 2.2 | + 4.2 | + 5.7 | + 9.9 | + 1.2 | + 2.7 | |
| **Consumer Price Index** | | | | | | | | | | | | | |
| United States | +10.9 | +11.0 | +10.2 | + 9.6 | + 8.9 | + 8.4 | + 7.7 | + 6.8 | + 6.6 | + 6.7 | + 7.1 | + 6.3 | + 5.9 |
| Detroit[a] | +11.1 | + 9.5 | + 6.5 | + 5.0 | + 3.2 | + 4.6 | + 2.8 | + 3.7 | + 4.1 | + 3.9 | + 3.1 | + 3.3 | + 3.2 |

Source: Michigan Employment Security Commission, special release; Bureau of Labor Statistics, **The Employment Situation** (monthly); Motor Vehicle Manufacturers Association, special release; American Iron and Steel Institute, special release; Energy Information Administration, special release; F. W. Dodge Division of McGraw-Hill Information Systems Company, news release (monthly); and Bureau of the Census. **Monthly Retail Trade.**

a. Wayne, Oakland, Macomb, Livingston, Lapeer, and St. Clair counties.
b. Michigan minus Detroit area.
c. The number of wage and salary jobs, except agricultural, reported by employers.
d. Average hours worked by manufacturing production workers.
e. Average earnings among manufacturing production workers.

# Quarterly Personal Income in Michigan

| | Millions of dollars, annual rates, seasonally adjusted | | | | | | | Percentage change 82(1) to 82(2) | |
|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1981 | | | | 1982 | | | |
| | 4 | 1 | 2 | 3 | 4 | 1 | 2 | Michigan | United States |
| **TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK** | | | | | | | | | |
| **BY TYPE** | | | | | | | | | |
| Wage and salary disbursements | 59,316 | 59,988 | 61,364 | 61,856 | 60,274 | 60,380 | 61,853 | + 2.4 | + 1.0 |
| Other labor income | 7,372 | 7,523 | 7,800 | 7,938 | 7,765 | 7,951 | 8,355 | + 5.1 | + 2.2 |
| Proprietors income | 4,308 | 4,360 | 4,362 | 4,395 | 4,299 | 4,108 | 4,142 | + .8 | + 1.4 |
| Farm | 488 | 423 | 445 | 537 | 489 | 353 | 354 | + .3 | + .8 |
| Nonfarm | 3,820 | 3,937 | 3,917 | 3,858 | 3,810 | 3,755 | 3,788 | + .9 | + 1.5 |
| **BY INDUSTRY** | | | | | | | | | |
| Farm | 749 | 680 | 699 | 788 | 740 | 610 | 619 | + 1.5 | + 1.2 |
| Nonfarm | 70,247 | 71,192 | 72,828 | 73,401 | 71,598 | 71,829 | 73,730 | + 2.6 | + 1.1 |
| Private | 60,600 | 61,575 | 63,170 | 63,699 | 61,803 | 62,086 | 63,732 | + 2.6 | + 1.1 |
| Ag. Serv., For., Fish., and other | 164 | 171 | 169 | 169 | 170 | 166 | 162 | − 2.4 | + .3 |
| Mining | 357 | 363 | 396 | 433 | 413 | 424 | 344 | −18.9 | − 3.9 |
| Construction | 3,045 | 3,121 | 3,114 | 2,994 | 2,938 | 2,809 | 2,633 | − 6.3 | + .3 |
| Manufacturing | 28,767 | 29,431 | 30,355 | 30,596 | 28,693 | 28,964 | 30,568 | + 5.5 | + .4 |
| Nondurable goods | 4,607 | 4,679 | 4,865 | 4,857 | 4,680 | 4,833 | 5,002 | + 3.5 | + .9 |
| Durable goods | 24,160 | 24,753 | 25,490 | 25,739 | 24,013 | 24,132 | 25,566 | + 5.9 | + .1 |
| Transportation and public utilities | 4,128 | 4,056 | 4,197 | 4,270 | 4,192 | 4,265 | 4,272 | + .2 | + 7 |
| Wholesale trade | 3,730 | 3,778 | 3,861 | 3,944 | 4,006 | 3,952 | 3,906 | − 1.2 | + 1.0 |
| Retail trade | 6,292 | 6,299 | 6,391 | 6,514 | 6,380 | 6,293 | 6,326 | + .5 | + 1.8 |
| Finance, insurance, and real estate | 2,948 | 2,861 | 2,966 | 2,993 | 3,035 | 3,060 | 3,118 | + 1.9 | + 2.9 |
| Services | 11,170 | 11,495 | 11,722 | 11,787 | 11,976 | 12,153 | 12,402 | + 2.0 | + 2.0 |
| Government and government enterprise | 9,648 | 9,617 | 9,658 | 9,702 | 9,795 | 9,743 | 9,998 | + 2.6 | + 1.3 |
| Federal, civilian | 1,214 | 1,215 | 1,214 | 1,238 | 1,264 | 1,240 | 1,283 | + 3.5 | + .1 |
| Federal, military | 224 | 226 | 229 | 236 | 268 | 264 | 267 | + 1.1 | + .1 |
| State and local | 8,210 | 8,176 | 8,215 | 8,227 | 8,264 | 8,239 | 8,449 | + 2.5 | + 1.8 |
| **DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE** | | | | | | | | | |
| Total labor and proprietors income by place of work | 70,996 | 71,871 | 73,527 | 74,189 | 72,338 | 72,439 | 74,349 | + 2.6 | + 1.1 |
| Less: Personal contributions for social insurance by place of work | 3,491 | 3,828 | 3,910 | 3,921 | 3,794 | 3,915 | 4,001 | + 2.2 | + .7 |
| Net labor and proprietors income by place of work | 67,505 | 68,043 | 69,617 | 70,268 | 68,544 | 68,524 | 70,349 | + 2.7 | + 1.1 |
| Plus: Residence adjustment | 452 | 468 | 467 | 475 | 476 | 472 | 472 | — | + 1.4 |
| Net labor and proprietors income by place of residence | 67,957 | 68,511 | 70,084 | 70,744 | 69,020 | 68,996 | 70,821 | + 2.6 | + 1.1 |
| Plus: Dividends, interest, and rent | 13,348 | 14,384 | 15,112 | 15,964 | 16,461 | 16,826 | 17,320 | + 2.9 | + 2.8 |
| Plus: Transfer payments | 14,193 | 13,970 | 14,030 | 14,305 | 14,673 | 14,727 | 15,555 | + 5.6 | + 3.0 |
| State U.I. benefits | 1,300 | 1,071 | 1,251 | 1,058 | 1,472 | 1,445 | 2,027 | +40.2 | +26.5 |
| Transfers excluding state U.I. | 12,893 | 12,899 | 12,779 | 13,247 | 13,201 | 13,282 | 13,528 | + 1.8 | + 1.8 |
| Personal income by place of residence | 95,499 | 96,864 | 99,225 | 101,012 | 100,154 | 100,549 | 103,697 | + 3.1 | + 1.7 |

Source: Bureau of Economic Analysis, special release.

## BRIEF

*(Continued from page 3)*

increase in the gap between the haves and have-nots here than nationally, not only within the central city but between the central city and its suburbs.

When the 1982 income and poverty data are released in July 1984, they likely will reveal further erosion in the ranks of Detroit's middle class since the unemployment rate has risen since 1980. Ultimately, recovery in the automotive industry will be reflected in the income and poverty figures; however, it seems unlikely that the fortunes of Detroit's middle class will be fully restored to their 1978 levels during this decade. Too many automotive jobs are permanently lost to automation, downsizing and imports. The kinds of industries likely to flourish here during the rest of the 1980s cannot provide enough middle income jobs to absorb these displaced workers.

### TABLE 2
### Poverty Rate for the Twenty Largest Standard Metropolitan Statistical Areas: 1978 and 1980

| Area | Persons 1978 | Persons 1980 | Families 1978 | Families 1980 |
|---|---|---|---|---|
| New York | 13.6 | 15.7 | 11.9 | 12.6 |
| Los Angeles-Long Beach | 10.9 | 11.7 | 8.9 | 9.0 |
| Chicago | 9.7 | 12.9 | 7.4 | 10.7 |
| Philadelphia | 11.2 | 11.7 | 9.3 | 9.4 |
| Detroit | 6.6 | 13.1 | 5.3 | 11.1 |
| San Francisco-Oakland | 7.6 | 7.9 | 5.4 | 6.0 |
| Washington, D.C. | 6.1 | 8.3 | 4.6 | 6.0 |
| Boston | 11.9 | 10.7 | 7.8 | 10.3 |
| Pittsburgh | 5.6 | 8.1 | 4.4 | 5.6 |
| St. Louis | 9.2 | 10.5 | 7.4 | 8.4 |
| Baltimore | 10.2 | 10.9 | 8.4 | 9.4 |
| Cleveland | 5.7 | 7.5 | 4.5 | 6.6 |
| Houston | 11.9 | 10.7 | 10.0 | 8.9 |
| Newark | 11.7 | 9.0 | 9.8 | 7.5 |
| Minneapolis-St. Paul | 6.1 | 7.3 | 4.7 | 4.8 |
| Dallas | 6.8 | 11.3 | 5.7 | 9.1 |
| Seattle-Everett | 6.7 | 8.8 | 6.3 | 7.3 |
| Anaheim-Santa Ana-Garden Grove | 5.4 | 7.0 | 3.3 | 5.7 |
| Milwaukee | 6.0 | 7.7 | 5.1 | 5.9 |
| Atlanta | 12.3 | 9.5 | 10.3 | 7.0 |
| All U.S. SMSAs | 10.4 | 11.9 | 8.3 | 9.4 |

SOURCE: U.S. Department of Commerce, Bureau of the Census, **Current Population Reports**, Series P-60, nos. 124 and 133 (Washington, D.C.: annually).

### TABLE 3
### Income Size Distribution, Median, and Mean Income Among Detroit Area and All U.S. Standard Metropolitan Statistical Area Households: 1978 and 1980

|  |  |  |  |  | U.S. |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  | Detroit (city) |  | Detroit (suburbs) |  | All central cities |  | All suburbs |  |
| Income class | 1978 | 1980 | 1978 | 1980 | 1978 | 1980 | 1978 | 1980 |
|  |  |  |  | (number of households in thousands) |  |  |  |  |
| Under $10,000 | 153 | 193 | 167 | 156 | 9,004 | 8,013 | 7,169 | 6,157 |
| $10,000–$14,999 | 57 | 45 | 105 | 96 | 3,987 | 3,781 | 4,374 | 4,109 |
| $15,000–$19,999 | 86 | 55 | 155 | 104 | 3,462 | 3,268 | 4,694 | 4,012 |
| $20,000–$24,999 | 59 | 30 | 127 | 133 | 2,440 | 2,711 | 4,150 | 4,136 |
| $25,000–$29,999 | 32 | 38 | 116 | 133 | 1,627 | 2,021 | 3,057 | 3,501 |
| $30,000–$49,999 | 53 | 73 | 226 | 290 | 2,204 | 3,590 | 4,778 | 7,219 |
| $50,000 and over | 6 | 9 | 79 | 106 | 634 | 1,088 | 1,213 | 2,470 |
| Total | 446 | 445 | 974 | 1,018 | 23,363 | 24,473 | 29,436 | 31,599 |
|  |  |  |  | (median and mean income) |  |  |  |  |
| Median income | $15,623 | $12,676 | $22,392 | $26,000 | $13,089 | $15,629 | $18,239 | $21,699 |
| Mean income | 16,672 | 16,635 | 24,962 | 28,000 | 16,305 | 19,237 | 20,743 | 24,757 |

SOURCE: U.S. Department of Commerce, Bureau of the Census, **Current Population Reports**, Series CPRP-60, nos. 126 and 132 (Washington, D.C.: annually).

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## COPING WITH JOB STRESS

*(Continued from page 2)*

examined, only trait anxiety accounted for a small but significant part of the associations between stressors, felt stress, and coping. The results indicated that when trait anxiety was held constant, the magnitude of the associations between stressors and maladaptive coping behaviors declined. The results showed that gender did not materially alter the pattern of relationships and stress reactions. This suggests that previously observed sex differences may have been a result of males and females occupying jobs at different levels of the organizational hierarchy. Organizational tenure also failed to have the expected moderating effects on the relationships between job stressors, felt stress, and coping. Additional research using multivariate techniques of analysis needs to be done to isolate other personal and organizational variables that might explain a larger part of the variations in stress reactions and coping.

The present study represents a first step in the identification of adaptive and maladaptive coping mechanisms. While further research needs to be done to refine and elaborate the measures of coping, the results of this study suggest that training programs might be useful in helping individuals learn adaptive coping behaviors and reduce the incidence of dysfunctional coping behaviors. It is also likely that effective coping may constitute an important intervening variable between felt stress and second level outcomes such as performance, absenteeism, and turnover.

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# UI FUND INSOLVENCY AND DEBT IN MICHIGAN

by SAUL J. BLAUSTEIN, *Senior Research Staff Economist, W. E. Upjohn Institute for Employment Research*

Without changes in Michigan's current unemployment insurance (UI) law, the state's UI debt of $1.6 billion, as of mid-1982, will probably rise to about $2.8 billion by the end of 1983 and to $3.8 billion by the end of 1985. Interest payments alone on these additional federal loans would amount to hundreds of millions over these years. Despite some slow, moderate decline, unemployment is likely to continue to be relatively high in Michigan for the next several years. Revenues produced by the state's existing UI tax structure will not come close to paying for expected benefit outlays, let alone repay any of the debt. Interest costs will have to be covered from other funding sources. Beginning with the federal UI payroll tax due for 1982, payable January 1983, Michigan employers will have to pay an additional penalty rate each year. The first penalty payment equals 0.3 percent of taxable payrolls; the rate rises progressively by 0.3 annually. Penalty tax proceeds, expected to total over $300 million through 1985, apply toward reducing the outstanding debt.

## FINANCING OF UNEMPLOYMENT INSURANCE

Employers in Michigan are solely responsible for financing unemployment insurance benefits paid under the state's law, as is the case in all but three other states.[1] Currently, the state UI tax on Michigan employers ranges between 1.0 and 9.0 percent of taxable wages, the first $6,000 paid to each employee in a calendar year. The rate varies among employers on the basis of their experience with unemployment. New employers pay a standard rate of 2.7 percent for the first two years, after which experience rating begins to introduce some variation. Taxes and payrolls estimated for 1981 in Michigan indicated an average tax rate of about 4 percent of taxable payrolls, or about 1.3 percent of total payrolls.[2] For 1982, these rates are expected to average about the same. The estimated 1982 average tax rate for Michigan, on the basis of total payrolls, is above the national average, but lower than the average rates expected in 19 states.

State UI taxes paid are deposited in a state account maintained in the Unemployment Trust Fund in the United States Treasury. Each state has such an account. The Michigan account represents the trust fund reserves for benefits payable to the state's insured unemployed workers. These reserves may be used only for the payment of benefits or for the repayment of loans made to pay benefits. Funds

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*Unemployment Insurance Fund Insolvency and Debt in Michigan*
by Saul J. Blaustein

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**Living Costs in Detroit, a Brief / page 7**

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are withdrawn to pay benefits, as needed, and tax revenues are deposited when collected.

Ideally, each state manages its UI finances so that sufficient reserves accumulate to handle benefit needs as they arise. Because of varying economic conditions, benefit needs can and do fluctuate widely over time. To remain solvent, the state's trust fund reserves must be ample to withstand a sudden heavy drain brought on by a steep rise in unemployment with its attendant soaring benefit costs, as occurs in recession periods. With few exceptions, state funds managed to remain solvent over the years, until the 1970s.[3] In that decade, in which two recessions occurred, insolvency became widespread. From 1972 through the end of June 1982, a total of 29 states exhausted their benefit reserves and required loans to continue the payment of benefits. Most, including Michigan, first borrowed in 1975 or 1976. As of June 30, 1982, 19 of these states were in debt for a total of $7.8 billion.

Besides the state UI tax, employers pay a federal UI tax. Specified under the Federal Unemployment Tax Act (FUTA), this tax currently applies also to the first $6,000 of wages paid to employees each year. The FUTA tax rate is 3.4 percent.[4] A credit of 2.7 percent is allowed against the full federal tax, however, to employers in states with approved UI laws.[5] The net federal tax therefore is 0.7 percent of taxable wages, a uniform rate payable by all private, for-profit employers throughout the country.[6] Revenues raised by the 0.7 percent net tax go into federal accounts in the Unemployment Trust Fund to finance UI administrative expenses,[7] the federal share of extended benefit costs,[8] and a federal loan fund from which states borrow if their own reserves are depleted. The loan fund was established in 1954. Provisions for borrowing and repayment have been amended often. Loans made before April 1, 1982 and still outstanding are interest-free; loans made from that date on do bear interest.

## THE MICHIGAN UI TAX STRUCTURE

The state's present UI tax is made up of three components, each contributing to the overall tax rate assigned to each employer. These include:

(1) A chargeable benefit component (CBC)—a rate ranging from 0 to 6.0 percent based on experience as measured by the employer's benefit ratio, i.e., benefits charged to an individual employer's account over the last five years taken as a percent of that employer's taxable payrolls in those years.

(2) An account building component (ABC)—a rate ranging from 0 to 2.0 percent based on the balance in an employer's account (all past benefits charged less all taxes paid, excluding NBC taxes—see below) compared with what the balance should be to meet a minimum solvency standard. The extent to which the employer's account balance falls below its required minimum solvency level is calculated, and a fraction or multiple of 0.25 of this deficiency is divided by the employer's total payroll for the year. The result is taken as the ABC rate for the tax year, up to the maximum of 2.0 percent.[9] Although calculated as a percent of total payroll, the ABC rate is applied to taxable payroll.

(3) A nonchargeable benefit component (NBC)—a uniform tax rate, currently at its maximum level of 1.0 percent, to cover certain pooled costs, including benefit costs of employers who go into bankruptcy and the state share of extended benefit costs.[10]

All component tax rates apply to a state taxable wage base of $6,000. The total combined rate ranges from 1.0 to 9.0 percent. The first two components—the CBC and ABC—represent the experience-rated portion of the tax.

Two other details about the tax structure should be noted. With regard to the CBC and ABC rates, whenever the combined total of these rates equals or exceeds 4.0 percent, the amount of any increase in the tax rate from one year to the next is limited to 0.5 of a percentage point even though the experience rate calculations would call for a larger increase. There is no limit on rate reduction. Another special provision allows a credit against the NBC rate for half the rate increase in the FUTA tax imposed for debt repayment. Thus, a FUTA rate increase of 0.3 paid in one year would reduce the following year's NBC rate by 0.15, a 0.6 rate increase would reduce it by 0.3, and so on.

The existing state UI tax structure and taxable wage base were established in 1978. Table 1 shows what that structure has produced in recent years. Clearly, the taxes generated in 1980 and 1981 fell far short of benefit outlay levels in those years. With no reserves available, the shortfall created the need for substantial borrowing.

## STATE ELIGIBILITY AND BENEFIT PROVISIONS

On the eligibility and benefit side of the program, the following provisions are important to the discussion of various possibilities available for dealing with the insolvency problem:

(1) To qualify for any benefits, a claimant must have worked, during a 52-week base period preceding the first claim, in at least 18 weeks with earnings of no less than $67 in each week (20 times the minimum hourly wage of $3.35).

(2) There is no waiting week—benefits are payable for the first valid week of unemployment claimed.

(3) The weekly benefit amount (WBA) payable is 70 percent of the claimant's average weekly wage earned in the base period, less any income and social security taxes applicable, up to a maximum WBA equal to 58 percent of the statewide average weekly wage in covered employment. The current maximum WBA is $197.

(4) Regular benefits are payable for from 13.5 weeks to a maximum of 26 weeks of unemployment on the basis of 3 weeks of benefits for 4 weeks of employment in the base period.

(5) Extended benefits are payable during periods of high unemployment in the state and add 50 percent to the claimant's regular benefit duration entitlement, up to a combined maximum of 39 weeks. Extended benefits have been payable in Michigan because of its high rate of insured unemployment. (The federal government covers half the cost of extended benefits paid to claim-

ants with at least 20 weeks of base-period employment, but will not cover costs for the first week if the state has no waiting week for regular benefits.)

(6) Claimants who quit their jobs without good cause or are discharged for misconduct are disqualified; they may draw no benefits until after they have worked long enough to earn at least a minimum amount of wages and then are subsequently laid off under nondisqualifying conditions.

Provisions (1), (3), and (6) were enacted in 1980, but for only a limited period. They expire March 31, 1983, after which earlier provisions are to be restored. These are:

(1) A minimum requirement of 14 weeks of work with earnings of at least $25.01 per week.

(3) A WBA equal to 60 percent of the claimant's gross average weekly wage up to a maximum, based on the number of dependents claimed, ranging from $97 for claimants with no dependents to $136 for those with four or more dependents.

(6) Disqualifications for voluntary quits and misconduct discharges suspend benefits for 13 weeks, with a comparable reduction in duration entitlement; benefits may be drawn for unemployment after the suspension period ends.

## PAST AND RECENT BORROWING

Michigan qualified for and drew a federal loan of $113 million early in 1958, although its own reserves, apart from the borrowed funds, never did run out completely at that time. Since no interest was charged and repayments were not required to begin until more than four years had elapsed after the loan was made, repayments did not begin until 1963.[11] The debt was fully liquidated in 1967.

The recession of the mid-1970s was a severe one, hitting Michigan hard. By early 1975, the state's benefit reserves were exhausted and borrowing began. Over the next two years, the debt accumulated to a total of $624 million. Repayment was not required until November 1980. If not repaid by then, debt reduction was to take place through a series of increases in the FUTA net tax rate on Michigan employers. During the late 1970s, the state's economy experienced fairly good recovery. Benefit outlays declined well below 1975 levels, while expanded employment and payrolls combined with increased UI tax rates to rebuild the fund to a level where it was possible to repay the entire debt. In December 1979, the debt was repaid in full.[12]

During the latter part of 1979, however, the Michigan economy was again deteriorating. As benefit outlays rose sharply early in 1980, remaining benefit reserves were depleted quickly and borrowing from the federal loan fund resumed. Such borrowing has continued off and on since then, as unemployment has remained high. By the end of March 1982, the debt had grown to $1,563 million, none of which was subject to interest. Additional substantial borrowing is expected in the second half of 1982 and thereafter. The interest payable on debt incurred after March 31, 1982 is an obligation of the state but may *not* be paid from UI trust fund reserves.

## REPAYMENT PROVISIONS[13]

Federal rules currently in effect call for repayment of the Michigan UI debt by November 1982. If it is not repaid by then, progressive increases in the FUTA tax rate are imposed each year on Michigan employers, the proceeds of which go to reduce the outstanding debt.[14] The net federal tax rate of 0.7 percent will rise by a 0.3 "penalty rate" to 1.0 percent of 1982 taxable payrolls, due for payment in January 1983, and by a 0.6 rate to 1.3 percent for 1983, payable January 1984. It will increase by a 0.9 penalty rate for 1984 payrolls and by 1.2 for 1985, to a total FUTA rate for that year of 1.9 percent. If the FUTA increase for 1985 does not eliminate all of the remaining debt, then an additional tax, through a "solvency rate" increase, will be imposed for that year, up to as much as another 1.5 percent of taxable wages.[15] The total federal tax payable, combining the penalty and solvency rates with the basic net rate of 0.7 percent, could therefore equal the maximum 3.4 percent of taxable payrolls in 1985 and later years, involving the loss of all of the federal tax credit normally allowed. The proceeds of the FUTA tax increases apply to reduce the outstanding loans in the order they were made, i.e., the oldest unpaid loans are retired first. That means that the interest-free portion of the debt will be repaid first through this process.

At any time, of course, the state may accelerate the rate of debt repayment. One incentive for doing so is to reduce the liability for interest. As debt incurred after March 31, 1982 increases, so will the interest that will be payable. Any repayments made from the state fund apply to the latest loans made which do bear interest. Another incentive for faster repayment is to limit, as far as possible, the FUTA rate increases which are imposed on all Michigan employers. A major concern with these increases is their effect on new employers who pay a standard state UI tax rate of 2.7 percent for the first two years. Combined with the federal rate, the total state and federal tax for new employers will probably go to 4.3 percent for 1984 and could go as high as 6.1 percent of taxable wages for 1985. Efforts to attract new industry to Michigan would be hampered by the increasingly discouraging disincentive of loading new employers with a repayment burden for past UI debt to which they had not contributed. To the extent that some FUTA increases may be unavoidable, some other type of relief for new employers may be needed.

Another concern with the uniform FUTA increases is that they tend to nullify much of the desired effect of experience rating, appears to be strongly favored by the employer community in the state. All employers would share the debt repayment burden equally, in relation to their taxable payrolls, through the FUTA tax rate method of repayment, regardless of wide variations among them in their past benefit charges. To the extent that experience rating continues as a preferred policy in Michigan, the emphasis is on raising more of the necessary funds for repayment through the state's UI tax structure, particularly through its experience-rating components, than through uniform federal tax increases.[16]

*(Continued on page 6)*

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# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 38.6 | 40.1 | 38.2 (Sept.) |
| Average weekly hours, U.S. | 39.5 | 39.0 | 38.8 (Sept.) |
| Average hourly earnings, Michigan ($) | 10.70 | 11.21 | 11.34 (Sept.) |
| Average hourly earnings, U.S. ($) | 8.16 | 8.51 | 8.59 (Sept.) |
| U.S. motor vehicle production (units) | 580,993 | 504,472 | 570,570 (Sept.) |
| Michigan electricity usage (mil. kwh.): | | | |
| Industrial (mil. kwh.) | 2,800 | 2,415 | 2,468 (June) |
| Residential (mil. kwh.) | 1,594 | 1,510 | 1,563 (June) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 794 | 597 | 550 (Aug.) |
| United States (000 net tons) | 10,120 | 5,719 | 5,538 (Aug.) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 284.2 | 292.7 | 294.9 (Sept.) |
| United States | 279.3 | 292.8 | 293.3 (Sept.) |
| U.S. producer price index (1967 = 100) | 295.5 | 300.6 | 299.5 (Sept.) |
| Michigan farm prices received index (1977 = 100) | 131 | 127 | 120 (Aug.) |

Source: U.S. Bureau of the Census; U.S. Bureau of Labor Statitstics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administraton.

# Contracts for Future Building, First 9 Months: 1981 and 1982

(Thousands of Dollars)

| Area | Nonresidential | | | Residential | | | Total[a] | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | Percentage Change | 1981 | 1982 | Percentage Change | 1981 | 1982 | Percentage Change |
| Ann Arbor | 47,492 | 55,784 | + 17 | 28,223 | 16,261 | − 42 | 75,715 | 72,045 | − 5 |
| Battle Creek | 14,630 | 46,954 | +121 | 11,763 | 8,097 | − 31 | 26,393 | 55,051 | +109 |
| Bay City | 9,331 | 5,906 | − 37 | 5,123 | 6,545 | + 28 | 14,454 | 12,451 | − 14 |
| Detroit | 626,713 | 336,055 | − 46 | 283,246 | 213,686 | − 25 | 909,959 | 549,741 | − 40 |
| Flint | 33,072 | 17,681 | − 47 | 29,182 | 21,723 | − 26 | 62,254 | 39,404 | − 37 |
| Grand Rapids | 101,677 | 66,310 | − 35 | 94,396 | 59,385 | − 37 | 196,073 | 125,695 | − 36 |
| Jackson | 12,968 | 5,334 | − 59 | 13,597 | 7,504 | − 45 | 26,565 | 12,838 | − 52 |
| Kalamazoo-Portage | 34,783 | 59,604 | − 71 | 57,872 | 25,254 | − 56 | 92,655 | 84,858 | − 8 |
| Lansing-East Lansing | 44,871 | 37,203 | − 17 | 86,208 | 30,109 | − 65 | 131,079 | 67,312 | − 49 |
| Muskegon-Norton Shores-Muskegon Heights | 7,913 | 16,679 | +111 | 20,104 | 10,320 | − 49 | 28,017 | 26,999 | − 4 |
| Saginaw | 10,660 | 17,314 | + 62 | 18,878 | 8,589 | − 55 | 29,538 | 25,903 | − 12 |
| Toledo | 126,726 | 87,403 | − 31 | 115,341 | 66,319 | − 43 | 242,067 | 153,722 | − 36 |
| Michigan | 1,096,022 | 750,266 | − 32 | 925,189 | 627,697 | − 32 | 2,021,211 | 1,377,963 | − 32 |
| United States | 45,264,100 | 45,367,100 | 0 | 47,970,600 | 41,756,800 | − 13 | 93,234,700 | 87,123,900 | − 7 |

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

Note: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing-East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; Muskegon-Norton Shores-Muskegon Heights includes Muskegon and Oceana counties; and Toledo includes Monroe County, Michigan, and Fulton, Lucas, Ottawa, and Wood counties, Ohio.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1981 and 1982 figures for nonbuilding construction contracts were $645,753,000 and $423,727,000 respectively, or a decrease of 34 percent. For the United States they were $24,853,700,000 and $27,025,900,000 respectively, or an increase of 9 percent. Total bulding and nonbuilding construction contracts declined by 32 percent in Michigan and 3 percent nationwide.

# Year-to-Year Change in Selected Economic Indicators

| | Percentage change from previous year | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | | | | 1982 | | | | | | | | |
| **Indicator** | **Sept.** | **Oct.** | **Nov.** | **Dec.** | **Jan.** | **Feb.** | **Mar.** | **Apr.** | **May** | **June** | **July** | **Aug.** | **Sept.** |
| **Civilian Employment** | | | | | | | | | | | | | |
| United States | +1.1 | +1.0 | +0.7 | 0 | −0.3 | −0.5 | −0.9 | −1.5 | −0.9 | −0.7 | −1.1 | −1.0 | −0.5 |
| Michigan | +1.7 | +1.9 | +1.4 | −2.5 | −2.1 | −1.0 | −3.4 | −5.0 | −3.5 | −5.0 | −3.0 | −4.0 | −4.0 |
| Detroit area SMSA[a] | +0.8 | +0.6 | +0.6 | −3.7 | −3.0 | −2.2 | −4.3 | −5.8 | −4.2 | −5.8 | −4.0 | −4.6 | −4.8 |
| Outstate[b] | +2.5 | +2.9 | +2.1 | −1.5 | −1.3 | −0.1 | −2.7 | −4.4 | −2.9 | −4.4 | −2.2 | −3.5 | −3.3 |
| **Wage and Salary Jobs[c]** | | | | | | | | | | | | | |
| United States | +1.4 | +1.1 | +0.5 | −0.1 | −0.5 | −0.5 | −0.8 | −1.1 | −1.1 | −1.4 | −1.7 | −2.1 | −2.5 |
| Michigan | +0.3 | −1.9 | −2.9 | −4.3 | −4.4 | −4.0 | −4.5 | −5.4 | −5.1 | −5.0 | −5.1 | −4.2 | −5.5 |
| Detroit area SMSA[a] | −0.7 | −2.6 | −3.5 | −5.0 | −4.7 | −4.7 | −4.8 | −5.7 | −5.5 | −6.0 | −5.3 | −4.6 | −6.3 |
| Outstate[b] | +1.2 | −1.2 | −2.3 | −3.6 | −4.1 | −3.3 | −4.1 | −5.1 | −4.8 | −4.1 | −4.9 | −3.9 | −4.7 |
| **Average Workweek[d]** | | | | | | | | | | | | | |
| United States | −0.8 | −0.3 | −1.2 | −2.2 | −7.0 | −0.8 | −2.0 | −2.5 | −2.7 | −2.5 | −1.8 | −2.3 | −1.8 |
| Michigan | −3.5 | −1.5 | −2.7 | −4.3 | −10.5 | +2.3 | −2.9 | −1.0 | −2.2 | −0.5 | +1.0 | −1.2 | −1.0 |
| **Average Weekly Earnings[e]** | | | | | | | | | | | | | |
| United States | +9.0 | +8.5 | +6.6 | +5.0 | +1.3 | +6.8 | +5.0 | +4.2 | +3.8 | +4.1 | +4.7 | +3.6 | +3.4 |
| Michigan | +6.9 | +7.5 | +5.9 | +2.7 | +1.9 | +11.0 | +5.2 | +7.2 | +5.6 | +7.4 | +9.6 | +5.3 | +4.8 |
| **Motor Vehicle Assembly** | | | | | | | | | | | | | |
| United States | −12.4 | −18.4 | −24.6 | −24.2 | −33.1 | −23.7 | −15.7 | −16.2 | −14.3 | −12.7 | −3.5 | +1.4 | −1.8 |
| Michigan | +7.3 | −3.5 | −13.6 | −20.4 | −19.4 | −8.3 | −6.9 | −4.3 | −6.9 | −4.8 | +4.4 | +9.2 | +8.3 |
| General Motors | +7.5 | +4.3 | −6.2 | −9.7 | −16.3 | +3.1 | −12.3 | −12.1 | −14.4 | +1.3 | +15.6 | +36.4 | +17.0 |
| Ford | +14.1 | −10.5 | −30.7 | −53.7 | −46.0 | −19.5 | +9.2 | +16.8 | +19.5 | −6.6 | −1.0 | −28.2 | −13.8 |
| Chrysler | −9.9 | −22.8 | −11.8 | −12.7 | +20.2 | −44.5 | −6.8 | −0.8 | −13.5 | −30.0 | −43.6 | +4.7 | +21.4 |
| **Steel Tonnage Poured** | | | | | | | | | | | | | |
| United States | +23.8 | −4.7 | −20.8 | −24.6 | −26.9 | −28.4 | −31.5 | −37.9 | −41.3 | −42.1 | −43.7 | −45.3 | |
| Michigan | +25.3 | −21.4 | −22.4 | −13.3 | −35.1 | −35.8 | −34.2 | −25.8 | −21.7 | −23.3 | −24.6 | −30.7 | |
| **Commercial Electricity Consumption** | | | | | | | | | | | | | |
| United States | −0.3 | +1.7 | +2.1 | +2.3 | +4.0 | +5.1 | +5.5 | +5.6 | +1.8 | −.1 | | | |
| Michigan | −0.2 | −1.9 | −2.6 | 0 | −2.8 | +4.0 | −0.8 | +1.9 | −.2 | −1.9 | | | |
| **Industrial Electricity Consumption** | | | | | | | | | | | | | |
| United States | +2.0 | −0.4 | −2.2 | −6.4 | −6.2 | −6.9 | −6.0 | −7.9 | −9.1 | −11.1 | | | |
| Michigan | −0.8 | −9.7 | −7.6 | −19.4 | −10.7 | −17.2 | −9.6 | −11.2 | −8.8 | −11.9 | | | |
| **Nonresidential Construction Contracts** | | | | | | | | | | | | | |
| United States | | | | | | | | −16 | −15 | +10 | −10 | 0 | +2 |
| Michigan | −11 | −38 | −76 | −52 | −24 | −52 | −14 | −55 | −62 | +30 | −37 | −33 | −23 |
| **Residential Construction Contracts** | | | | | | | | | | | | | |
| United States | | | | | | | | −15 | −29 | −5 | −12 | +11 | +14 |
| Michigan | −36 | −47 | −60 | −53 | −44 | −58 | −47 | −42 | −36 | −29 | −40 | −33 | −28 |
| **Nonbuilding Construction** | | | | | | | | | | | | | |
| United States | | | | | | | | +8 | +5 | +8 | +7 | +52 | +18 |
| Michigan | +32 | −8 | −17 | +9 | +7 | −52 | −37 | −72 | −1 | −23 | −36 | −36 | −5 |
| **Retail Sales** | | | | | | | | | | | | | |
| United States | +10.9 | +6.3 | +4.7 | +5.7 | +0.2 | +2.7 | +2.6 | +2.6 | +3.8 | +1.1 | +2.2 | +.2 | |
| Michigan | +7.3 | +1.3 | +0 | +0.5 | −11.2 | −6.3 | −5.7 | −5.3 | +0.3 | −4.2 | −2.8 | −4.4 | |
| Detroit Area[a] | +4.3 | −1.6 | −2.6 | −3.9 | −17.2 | −13.6 | −14.3 | −14.6 | −8.3 | −9.7 | −8.1 | −9.1 | |
| Outstate[b] | +10.5 | +4.9 | +2.9 | +5.7 | −4.2 | +2.2 | +4.2 | +5.7 | +9.9 | +1.2 | +2.7 | +.4 | |
| **Consumer Price Index** | | | | | | | | | | | | | |
| United States | +11.0 | +10.2 | +9.6 | +8.9 | +8.4 | +7.7 | +6.8 | +6.6 | +6.7 | +7.1 | +6.3 | +5.9 | +5.0 |
| Detroit[a] | +9.5 | +6.5 | +5.0 | +3.2 | +4.6 | +2.8 | +3.7 | +4.1 | +3.9 | +3.1 | +3.3 | +3.2 | +3.8 |

Source: Michigan Employment Security Commission, special release; Bureau of Labor Statistics, **The Employment Situation** (monthly); Motor Vehicle Manufacturers Association, special release; American Iron and Steel Institute, special release; Energy Information Administration, special release; F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases (monthly); and Bureau of the Census, **Monthly Retail Trade.**

a. Wayne, Oakland, Macomb, Livingston, Lapeer, and St. Clair counties.

b. Michigan minus Detroit area.

c. The number of wage and salary jobs, except agricultural, reported by employers.

d. Average hours worked by manufacturing production workers.

e. Average earnings among manufacturing production workers.

## UI FUND INSOLVENCY AND DEBT

*(Continued from page 3)*

Amendments enacted in 1981 of the federal repayment provisions made it possible for a debtor state to qualify its employers for a ceiling or "cap" at 0.6 on the FUTA rate increase imposed for repayment purposes, or at a higher level of increase. For example, if the qualifying conditions are met, the 0.6 rate increase applicable for Michigan employers for the 1983 taxable year would apply for subsequent years (through 1987), or the 0.9 increase for 1984 could hold at that level for the next three years. To qualify for a cap after 1983, the following conditions must be met:

(1) No action is taken after August 1981 that reduces the state's UI tax effort.

(2) No action is taken after August 1981 that reduces the solvency of the state's fund, such as legislating benefit increases without compensating tax increases.

(3) The outstanding debt as of September 30 of the year for which the federal tax cap applies is not larger than the balance outstanding three years before. (For a 0.6 cap on the increase for 1984 in Michigan, for example, the debt balance on September 30 that year may not exceed the $1,015 million balance outstanding on September 30, 1981.)

(4) The average state UI tax ratio for the year of the federal tax cap is not less than the average of annual benefit-cost ratios of the five preceding years. (For this purpose, the average state tax ratio is total taxes paid into the state fund as a percent of total payrolls of taxable employers, and the annual benefit-cost ratio is total benefits paid out of the state fund during the year plus interest paid on loans as a percent of total payrolls for the year.)

At this time, qualifying for a cap on the FUTA increases appears to be remote as a possibility for Michigan, certainly at the 0.6 level. A 0.9 cap in 1985 may not be out of reach entirely, but it would be very difficult to achieve under conditions now foreseen.

### THE OUTLOOK—INCREASING DEBT AND HIGHER TAXES

Given current economic expectations and no changes in existing UI provisions, the prospects are for substantially more borrowing by the state fund over the next several years. Recent estimates made by the Michigan Employment Security Commission (MESC) show a continuing shortfall in state UI tax revenues during the 1982-85 period when benefit outlay projections range between $1.4 and $1.8 billion each year, while state tax revenues total less than $900 million annually. The projected total shortfall over these four years is over $3 billion, carrying the debt to more than $3.8 billion by the end of 1985 even after taking account of repayments made through FUTA tax increases in this period.

Not included on the above, since it is not paid from the trust fund, is the interest liability relating to funds borrowed after March 31, 1982. While very little interest is expected to be paid in 1982, the amount due in 1983 is estimated at about $84 million. While not estimated for later years, it is clear that the interest liability will rise steeply with the debt increases that have been projected.

The average Michigan employer faces rising UI taxes in coming years, even without changes in state tax provisions. As the high benefit outlays of the early 1980s increasingly dominate the five-year experience base used for calculating the chargeable benefit component of the state tax, the rates for many employers can only move upwards. Projections indicate that under the current law, the average state tax rate may rise from about 4 percent in 1981 to over 5 percent by 1985. The NBC tax credit for part of the FUTA penalty tax increase, however, would lower the 1985 net state tax rate to about 5 percent. Around the average, of course, tax rates vary considerably among employers because of experience rating.

A major division among employers is between those with negative and those with positive account balances.[17] At mid-1980 about 4 out of 10 employers had negative account balances; a year later, the proportion was nearly half. Negative account employers are mostly of two kinds. One type, such as found in construction and tourism, has significant seasonal operations followed by large layoffs about the same time every year. Employers of this type are always, or almost always, in a negative balance position, and are assigned at or near maximum tax rates. They include both high-wage and low-wage paying employers. The other type includes employers who are highly sensitive to recession conditions, such as firms engaged in durable goods manufacturing. Many are very large firms which pay high wages; automobile manufacturers are the leading examples. Since 1970, the proportion of all employers with negative balances has grown from about 20 percent to near 50 percent, mainly because of the impact of several recessions over these years. At mid-1981, all negative balances aggregated almost $1.5 billion, more than the amount of the fund's debt at that time. The state's UI tax structure has not been very effective in recouping as much of these heavy charges as one might expect considering the high maximum tax rate.[18] In 1981, fewer than 6 percent of all employers were at the 9.0 maximum rate; less than 10 percent had rates of 7.5 or higher. The largest concentration of taxable payrolls clustered at tax rates around the 5 percent level. The 0.5 limit on year-to-year rate increases has prevented greater concentration at higher rates. Among broad industry groupings, the UI tax rates in 1981 averaged highest in construction (6.3 percent), followed by manufacturing and mining (4.7 percent in each); finance, insurance, and real estate employers had the lowest average rate (2.6 percent).[19]

The federal net tax rate, currently at 0.7 percent, will rise as the rate increases for debt repayment are added. The total federal tax rate to be paid will be 1.3 for 1983, 1.6 for 1984, and could jump to as high as 3.4 percent for 1985, barring any efforts to accelerate debt repayment or a more rapid decline in unemployment than projected. After allowing for credits against the state tax rate for half the FUTA rate increases, up to the 1.0

*(Continued on page 7)*

# Brief

## LIVING COSTS IN DETROIT

In Dallas, Texas, a thirty-eight-year-old male, employed full time, his wife with no outside income, his eight-year-old daughter, and his thirteen-year-old son could purchase a socially modest, but adequate, standard of living on an annual income of $22,678 at autumn 1981 prices. This figure put Dallas last in cost of living among 25 geographically dispersed urban areas in the United States. Honolulu at $31,893 was first. Detroit was fifteenth with $25,208.

The revised series on urban family budgets was initiated by the Bureau of Labor Statistics with the publication of "modest but adequate" living costs in the autumn of 1966 and has been updated periodically since.

The modest-but-adequate, or moderate, family budget, like the lower budget, allows "for the maintenance of health and social well-being, the nurture of children, and participation in community activities." However, more liberal allowances are made for quality, quantities, and "manner of living." "The moderate standard benchmark also plays a role in the collective bargaining process by providing a basis for evaluating the adequacy of earnings of experienced workers. It provides estimates of aggregate requirements for consumer goods, used in developing public policy, and in market analysis. Judicial decrees for support orders and alimony payments take account of the middle standard in determining either ability to pay or the recipient's need. The standard is used also to determine equitable amounts to pay for subsidized medical, mental health, or guidance services."[1]

The standard is a composite derived from budget studies of renters and homeowners, and automobile owners and families that rely exclusively on public transit. It does not purport to show how households actually spend their incomes. Market baskets of goods and services were decided upon for food, based on nutritional standards established for 1965 along with 1960-1961 spending patterns, and for all other consumer expenditures excepting payroll taxes, from 1960-1961 expenditures patterns. Payroll tax rates and income exemptions are kept current.

For the nation as a whole, the annual cost of a moderate budget for the urban family of 4 described above was $25,407.[2]

### NOTES

1. John C. Brackett, "New BLS Budgets Provide Yardsticks for Measuring Family Living Costs," *Monthly Labor Review*, April 1969, p. 7.
2. Bureau of Labor Statistics, *News*, Bulletin 82-139 (Washington, D.C.: 1982), p. 2.

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## UI FUND INSOLVENCY AND DEBT

*(Continued from page 6)*

percent limit of the NBC rate, the combined average state and federal tax rate could rise from about 4.6 percent in 1981 to about 8.4 percent by 1985, based on current projections. It is important to bear in mind the assumption for these projections that the taxable wage base will continue at $6,000, for both state and federal tax rates. On the basis of projected total wages, the combined average state-federal tax rate could rise from approximately 1.5 percent in 1981 to about 2.3 percent in 1985. However one chooses to look at the problem, it represents a growing burden for Michigan employers generally.

Michigan's competitive position, vis-a-vis other states, in attracting new business and keeping the business it has is widely perceived as poor, although this view tends to be exaggerated.[20] High UI taxes are cited often as a negative factor in that connection. The outlook for continued high unemployment rates in the state and for mounting UI debt and taxes offers no relief from that perception. The discouraging effect of loading FUTA debt repayment increases on new employers was noted earlier. Firms which tend to have favorable UI cost experience and thereby qualify for low state rates would see their federal tax rates rise regardless, swamping the effects of experience rating. The state tax credits allowed for half the federal rate increases help to moderate that result, but not for new employers in their first years under the program. By itself, the existence of a serious and worsening insolvency problem with no plan yet in hand for dealing with it may be the most disturbing aspect of the state's UI program because of the uncertainties it poses about future costs for prospective new and expanding businesses.

**TABLE 1**
**Selected Unemployment Insurance Financial Data for Michigan: 1979–1981[a]**

| Item | 1978 | 1979 | 1980 | 1981 |
|---|---|---|---|---|
| Total payrolls (billions) | $41.9 | $45.4 | $44.6 | $47.5(E) |
| Taxable payrolls (billions)[b] | $17.1 | $17.6 | $16.4 | $16(E) |
| Percent of total payrolls taxable | 41% | 39% | 37% | 34%(E) |
| Average employer tax rate (percent of taxable payrolls) | 4.11% | 4.03% | 3.73% | 4%(E) |
| Total taxes collected (millions) | $691 | $724 | $618 | $624 |
| Total benefit outlays, including state share of extended benefits (millions) | $424 | $618 | $1,293 | $1,065 |

SOURCE: **Handbook of Unemployment Insurance Program Statistics, Michigan Employment Security Commission, Bureau of Research and Statistics, pp. 2, 35, and 44.**
(E) = Estimated.
a. Data for private, contributing employers covered by the Michigan Employment Security Act.
b. Based on taxable wage base of $6,000.

### NOTES

1. Employees also help finance benefits in Alabama, Alaska, and New Jersey.
2. Taxable payrolls accounted for only about a third of total payrolls as estimated for 1981.
3. Prior to 1972, only Alaska and Pennsylvania actually had to use borrowed funds to pay benefits; Michi-

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## UI FUND INSOLVENCY AND DEBT

*(Continued from page 7)*

gan borrowed funds in 1958 but never had to use them to pay benefits. Several other states qualified for loans in the late 1950s but chose not to borrow.

4. Congress had under consideration in August 1982 a proposed increase in both the FUTA tax base and rate, to become effective in 1983.
5. The tax credit allowed to an employer is for state UI taxes paid up to the 2.7 percent level, but if the employer pays a state tax that is lower than 2.7 percent because of experience rating, the full 2.7 percent credit is allowed. All employers qualify for the full credit on this basis.
6. Nonprofit and governmental employers are not subject to the federal tax.
7. Annual federal grants to the states cover all their UI program administrative costs.
8. The state and federal governments share equally the costs of extended benefits paid to insured unemployed workers who exhaust their regular state UI benefits during periods of high unemployment.
9. The minimum solvency standard is 3.58 percent of total payrolls, representing the highest 12-month benefit-cost ratio experienced by the state since 1956. That occurred in the 12 months ending November 1975. The ABC tax rate for an employer is calculated by the following formula:

$$\frac{.25\ (.0358 \times \text{total payroll-current balance})}{\text{total payroll}}$$

10. An NBC tax applies as long as the total state fund (excluding debt outstanding) remains below a specified solvency position; as the fund rises sufficiently towards that level, the NBC rate declines and becomes zero when it reaches or exceeds that level.
11. Federal borrowing and repayment rules were stiffened after this experience.
12. Although repayment was not required until the following November, the funds available at the time would have gone to pay benefits in 1980 instead, leaving none for loan repayment, and the FUTA tax rate increases would have begun in 1980. The new loans necessary in 1980 were not due for repayment until November 1982. Full repayment of the earlier debt, therefore, postponed FUTA rate increases for two more years.
13. Provisions governing loans and their repayment are contained in Title XII of the Social Security Act and Section 3302 of the Federal Unemployment Tax Act; the repayment provisions were most recently amended by Section 2406 of the Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35). Additional amendments were enacted by the Congress in August 1982.
14. The FUTA rate increase occurs through a reduction in the 2.7 percent tax rate allowed as credit against the full FUTA tax rate of 3.4 percent.
15. The added solvency rate is the amount, if any, by which the average state UI tax rate (based on taxable wages) for the year falls short of the average annual benefit outlay of the prior five years as a percent of taxable payrolls for the year. The penalty and solvency rates combined may not exceed 2.7 percent, the amount of the full tax credit normally allowed. An amendment enacted in August 1982 will eliminate the solvency rate increase.
16. Congress amended the repayment provisions in August 1982 to allow states to pay the penalty tax amounts out of state UI funds instead of FUTA tax increases.
17. A negative balance occurs when the employer's tax payments from the CBC and ABC tax components have not been enough to cover past benefit charges.
18. The maximum tax rate has been 9.0 percent since 1981. It was 8.5 in 1980, 8.0 in 1979, and 7.5 in 1978.
19. Material in this paragraph is based on data supplied by MESC.
20. See Timothy L. Hunt, *The Business Climate in Michigan* (Kalamazoo, MI: The W. E. Upjohn Institute for Employment Research, 1982).

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# BARGAINING UNITS FOR STATE GOVERNMENT

by JAMES E. MARTIN, *Associate Professor, Management and Industrial Relations, School of Business Administration, Wayne State University,* and RICHARD L. SMITH, *General Motors Corporation*

Is one's occupation in state government a more appropriate basis for collective bargaining than the department in which one works? Many experts in labor management relations say yes for three basic reasons. First, occupational bargaining units facilitate greater uniformity in benefits and working conditions among people with similar jobs. Second, since state government employees fall in fewer occupational than departmental categories, the labor-management negotiating process is simpler. Fewer negotiations allow both sides to use more sophisticated professional negotiators and reduce union competition in the form of "leapfrogging" or "whipsawing" of settlements. Third, costs are reduced through both the containment of union competition and the reduction of administrative costs in negotiating agreements. In addition, many job classifications cross departmental lines, and occupational units eliminate the problem of bargaining separately with unions representing employees in the same classificaiton but different departments. These arguments, based primarily on impressionistic qualitative data and authoritative opinion, have now been generally accepted by policy makers without any quantitative empirical research support and little qualitative support.

## PREVIOUS RESEARCH

Most of the arguments for smaller or departmental units focus on the attention that can be given to particular groups of employees. For example, Seidman and Staudohar recognized that the interests of small groups within broad occupational statewide units might be overlooked and questioned whether such units would be an effective vehicle for the resolution of purely local issues.[1] Summers felt that in a very large unit, whether departmental or occupational, the diverse interests of employees might not be resolved by the union, resulting in the union making many demands designed to satisfy its different constituencies. Thus Summers concluded, based on his observations of bargaining in several cities, that "while multiple bargaining units add to the employer's negotiating burden, that cost may be less than negotiating with a conglomerate union which is trying to represent greater diversity than its internal processes can reconcile."[2]

While the literature suggests that departmental units offer some potential advantages over broad occupational units, in certain areas there are also some potential disadvantages associated with such units. For example, intraorganizational bargaining problems could result in trying to meet the diverse needs of different occupational groups within one departmental unit. Because of that, Begin concluded such a unit was particularly susceptible to factionalism, and that factions could bypass the union leadership in a form of multilateral negotiations to deal directly with the employer or an employer faction.[3] Large departmental units also share some of the size-related problems of large occupational units.

**Government in Distress, by
David I. Verway / page 3**

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A review of the literature found two empirical studies which examined the impact of alternative bargaining unit structures in the public sector on different outcomes.[4] However, both examined only local government municipalities and special districts. In addition, both studies compared departmental units with intradepartmental occupational units. These were more like narrow craft units within a department instead of a grouping of all similar classes, either across departments or within a particular department. For example, Perry and Angle surveyed public transit organizations by focusing on the bus operators' bargaining unit. Their overall results provided a mixed picture of the correctness of many of the traditional arguments presented in the literature concerning the consequences of particular bargaining structures. They found craft structures were associated with more favorable membership perceptions of internal union affairs. Departmental units were correlated with both more favorable union-management outcomes and organizational outcomes. Gerhart, on the other hand, found no significant relationship between an index of contract outcomes and departmental or craft-type occupational unit structures across governmental functions. He concluded that unit structure was so closely related to government function that it had no independent influence on bargaining outcomes. Thus, these two studies, while not dealing directly with the specific issue examined in this paper. raised questions about the conventional wisdom in this area.

Moore focused on the impact of alternative bargaining unit structures on productivity and organizational effectiveness.[5] He argued that departmental units were superior to broad occupational units and more in the public interest based on a number of criteria, including productivity bargaining, strikes, contract administration, and innovation. Moore's work, however, was not tested empirically.

## A MICHIGAN STUDY

The authors obtained the November 1978 State of Michigan personnel records tape of all 55,000 nonsupervisory Civil Service state employees. Michigan was a particularly appropriate state in which to carry out a study since it had just changed its bargaining unit structure. Prior to 1978, units were based on departments with a limited scope of bargaining. While there were only twenty-one state departments, there were thirty units. This was because seven large departments placed their employees in "administration" or in the central office in separate units from the remaining employees. Most of those remaining employees were working in institutions or locations where the department actually delivered services to the public.[6] In addition, the Department of Social Services had one large unit for its employees located in Wayne County, where over 40 percent of the state's welfare recipients live, a large unit for employees involved in the delivery of social services in the rest of the state, and a small unit at its one institution. These units in theory were organized on a closer community of interest than a pure departmental structure would have been.

In 1978, twelve occupational bargaining units were established as follows: administrative support, business administrative, engineering and scientific, human services, human service support, institutional, labor and trades, safety and regulatory, security, state police, technical, and supervisory. The scope of bargaining was also increased for the new units.

The nine thousand employees in the supervisory unit were excluded from the study because they could not achieve full bargaining rights.[7] Among the remaining units, statistical analysis was applied to determine the degree of uniformity as compared to that within departments. The analysis was based on age, race, sex, work location (urban or rural), tenure, and Civil Service assigned job level. Each of these factors was evaluated on the basis of the extent to which it was influenced by the occupational or departmental distinction.

Table 1 shows the results of the statistical analysis. Essentially, those figures suggest that the occupational and departmental distinctions make no difference in the age and tenure factors. In job level, occupation is responsible for 64.2 percent of the variability among civil servants compared with only 18.5 percent for departmental classification, i.e., occupation is about 3.5 times more homogeneous than department on job level. That difference means that there is generally a lesser range of job levels in the occupations with an accompanying restriction in the opportunities for career mobility when compared with the departments. Occupation accounts for 42.5 percent variability in sex, indicating that occupations are somewhat segregated by sex. Department only shows 21.3 percent variability in sex, so the departments are much less sexually segregated than occupations. Departments have 24.2 percent variability in location, about 60 percent more than occupations, a function of the type of service delivered and its corresponding urban or rural location. Statistically, departments show 14.2 percent variance in race, compared to about 3 percent accounted for by occupation, indicating that the departments are slightly segregated by race while the occupations have almost no segregation. When the greater homogeneity in sex by occupation is combined with the greater homogeneity of job levels, it indicates that affirmative action programs for women will be much more difficult to carry out within most occupational bargaining units when compared with departmental units.

Table 2 presents data on the highest civil service job levels within the different unit forms. For both departmental and occupational bargaining units, the number of units are tabulated by the highest job level which exists within those units. In addition, the number of employees in units which have that level as their highest level and the cumulative number and percent of employees which have that level or a higher level as their highest level are shown. The data show that the occupational units are much more limited by the highest job level than departmental units. The thirty departmental units have a significantly greater average highest job level than the eleven occupational units. Further exam-

*(Continued on page 5)*

# GOVERNMENT IN DISTRESS

*by* DAVID I. VERWAY, *Director, Bureau of Business Research, School of Business Administration, Wayne State University*

The burden of state taxes in Michigan declined for the second consecutive year, according to data released recently by the Bureau of the Census. During the 1981 fiscal year, the state ranked thirty-second in state tax burden compared with twenty-second in 1979. Alaska because of its taxation of North Slope oil, topped the 1981 list. At the bottom stood New Hampshire, the only state with neither a general sales tax nor a general income tax.

The burden of local taxes in Michigan increased for the second year in a row, making Michigan thirteenth in this burden during 1981. Local treasuries here benefitted from property tax receipts fueled by the fast rise in valuation of residential real estate.

As it is used above, the term *tax burden* refers to the relationship between taxes and personal income. This yardstick is crude, among other reasons because a not inconsiderable proportion of taxes is levied on businesses, not households. Michigan's Single Business Tax is an example. While it is true that businesses pass the SBT on to the consumer to the extent possible, it also is true that the tax is reflected in reduced earnings by stockholders, management, and labor. Finally, to an unknown extent the SBT is passed on to consumers and stockholders in other states. Texans, for example, bear some of the SBT when they purchase Cadillacs, Oldsmobiles, or Buicks. On the other hand, they also derive tax benefits from our gasoline purchases.

Like other states, Michigan shares its revenues with local units of government. By law, 60 percent of state sales taxes are passed on to school districts; 15 percent is sent to cities, villages, and townships, and 25 percent goes into the state's general funds where it may be spent for education, welfare, and other programs at the discretion of the governor and legislature. The state keeps 44.5 percent of its gasoline tax receipts for its Comprehensive Transportation Fund, which must be spent on state transportation needs, as well as the transportation needs of counties, cities, and villages. SBT proceeds flow into the state's general fund; local units are reimbursed for revenues lost as a result of the repeal of the inventory property tax when the SBT was introduced. The individual income tax, horse race wagering tax, cigarette tax, and several other state levies are shared with local units on a formal basis similar to sales and gasoline taxes. The state also is required to make at least 41.6 percent of its expenditures through local units in compliance with a constitutional amendment which was adopted in 1978, the so-called Headlee Amendment.

Revenues flow from Washington to state and local governments as a result of a vast array of social, economic, and political concerns of Congress and the president. Washington pays half of Michigan's public welfare costs, for example, regardless of what the total dollar figure may be and irrespective of the amount of federal taxes collected from any source. Other federal programs of aid to state and local governments resemble earmarking employed so often by state governments. Most gasoline taxes, for example, are divided up among the states on a formula basis.

In 1981, about 22 percent of Michigan state and local government general revenues originated at the federal level; 42 percent was collected by the state, and 36 percent was derived locally. After earmarking and other intergovernmental transfers, the state controlled 42 percent and local units 58 percent of the total amount available that year. Only during 1973 did the state's share exceed the 1981 figure.

Nationally, the 1981 proportions were 40 percent controlled by the states and 60 percent by local units of government. Both here and across the nation, the long-term trend has been toward greater state control of state-local revenues. In 1960, for example, the state and local proportions were 32 percent and 68 percent compared with 36 percent and 64 percent nationally.

## EXPENDITURES

Despite drops in enrollment and the number of classroom teachers, spending on public schools, the largest category of state or local outlay, increased at the same rate as the overall government expenditure total. Average teachers' salaries rose rapidly here, by 22 percent between October 1979 and 1981 compared with 17 percent nationally. Whereas in 1979 Michigan trailed Alaska, California, and New York in average teachers' salaries, by October 1981 we were second among states behind Alaska.

Public welfare, largely the responsibility of the state, is the second largest category in terms of expenditure. State outlays for public welfare increased 25 percent between 1979 and 1981, primarily as a result of increased caseloads since payments per recipient have increased relatively little. Medicaid, which absorbs nearly half the welfare dollar, also rose at a considerably more rapid rate than most other kinds of government services. Medicaid is provided at state and federal expense to welfare recipients and other medical indigents.

More than anything else, the Comprehensive Transportation Fund depends on gasoline taxes. Consequently, state and local government spending on highways, third largest of the broad categories, grew slowly in Michigan. Government support for higher education (fourth) and health and hospitals (fifth) barely increased. Together the top five categories listed in Table 2 account for over two-thirds of general expenditures.

These expenditure figures can be expressed as a percentage of personal income. From these data it may be concluded that government in Michigan is more expensive than it is nationally because of higher welfare and local school costs, and that gap increased between 1979 and 1981. The state spends less than the national norm on highways and on health and hospitals, and that gap is rising. In 1979 Michigan slightly exceeded the

*(Continued on page 7)*

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# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 40.3 | 38.1 | 39.7 (Oct.) |
| Average weekly hours, U.S. | 39.7 | 38.9 | 39.0 (Oct.) |
| Average hourly earnings, Michigan ($) | 10.88 | 11.33 | 11.10 (Oct.) |
| Average hourly earnings, U.S. ($) | 8.16 | 8.59 | 8.56 (Sept.) |
| U.S. motor vehicle production (units) | 694,727 | 570,570 | 556,457 (Oct.) |
| Michigan electricity usage (mil. kwh.): | | | |
| Industrial (mil. kwh.) | 2,800 | 2,415 | 2,468 (June) |
| Residential (mil. kwh.) | 1,594 | 1,510 | 1,563 (June) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 579 | 478 | 413 (Oct.) |
| United States (000 net tons) | 9,003 | 5,302 | 5,262 (Oct.) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 281.5 | 294.9 | 295.2 (Oct.) |
| United States | 279.9 | 293.3 | 294.1 (Oct.) |
| U.S. producer price index (1967 = 100) | 296.1 | 299.5 | 299.2 (Oct.) |
| Michigan farm prices received index (1977 = 100) | 130 | 119 | 116 (Oct.) |

SOURCE: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administraton.

# Contracts for Future Building, First 10 Months: 1981 and 1982

(Thousands of Dollars)

| | Nonresidential | | | Residential | | | Total[a] | | |
|---|---|---|---|---|---|---|---|---|---|
| Area | 1981 | 1982 | Percentage Change | 1981 | 1982 | Percentage Change | 1981 | 1982 | Percentage Change |
| Ann Arbor | 49,129 | 60,356 | +23 | 29,155 | 17,473 | −40 | 78,284 | 77,829 | −.6 |
| Battle Creek | 14,936 | 47,059 | +215 | 12,790 | 9,051 | −29 | 27,726 | 56,110 | +102 |
| Bay City | 9,331 | 7,027 | −24 | 5,632 | 7,070 | +26 | 14,963 | 14,142 | −5 |
| Detroit | 668,406 | 412,658 | −38 | 304,323 | 253,389 | −17 | 972,729 | 666,047 | −32 |
| Flint | 36,424 | 20,304 | −44 | 31,482 | 24,094 | −23 | 67,906 | 44,398 | −35 |
| Grand Rapids | 113,920 | 99,268 | −13 | 106,992 | 65,020 | −39 | 220,912 | 164,288 | −26 |
| Jackson | 17,815 | 6,500 | −64 | 14,839 | 9,373 | −37 | 32,654 | 15,873 | −51 |
| Kalamazoo-Portage | 37,709 | 64,856 | +72 | 66,641 | 27,435 | −59 | 104,350 | 92,291 | −12 |
| Lansing-East Lansing | 45,896 | 40,079 | −13 | 89,110 | 38,094 | −57 | 135,006 | 78,173 | −42 |
| Muskegon-Norton Shores-Muskegon Heights | 8,217 | 17,356 | +111 | 21,810 | 12,413 | −43 | 30,027 | 29,769 | −.9 |
| Saginaw | 11,483 | 19,981 | +74 | 19,695 | 14,246 | −28 | 31,178 | 34,227 | −10 |
| Toledo | 135,129 | 103,196 | −24 | 122,899 | 76,238 | −38 | 258,028 | 179,434 | −30 |
| Michigan | 1,207,493 | 892,631 | −26 | 1,018,137 | 732,485 | −40 | 2,225,630 | 1,625,116 | −28 |
| United States | 51,159,500 | 50,330,800 | −2 | 52,752,800 | 47,332,500 | −10 | 103,882,300 | 97,663,300 | −6 |

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

Note: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing-East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; Muskegon-Norton Shores-Muskegon Heights includes Muskegon and Oceana counties; and Toledo includes Monroe County, Michigan, and Fulton, Lucas, Ottawa, and Wood counties, Ohio.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1981 and 1982 figures for nonbuilding construction contracts were $744,086,000 and $446,735,000 respectively, or a decrease of 40 percent. For the United States they were $27,649,600,000 and $28,904,100,000 respectively, or an increase of 5 percent. Total building and nonbuilding construction contracts declined by 30 percent in Michigan and 4 percent nationwide.

## BARGAINING UNITS

*(Continued from page 2)*

ples of the differences in highest job level are shown by the fact that 77 percent of the state work force are in departmental units which have their highest level at seventeen or above, compared to 30 percent for the occupational units. Three percent of the state work force are in departmental units with a highest level of less than twelve (enlisted state police troopers) compared to 55 percent in the occupational bargaining units. Thus, under the occupational unit structure, promotional opportunities to higher level jobs within the same bargaining unit would be much more severely limited than under the departmental unit structure.

The cross-tabulation of the eleven occupational bargaining units with the thirty departmental units indicates that six of the eleven occupations have a majority of their employees employed in one departmental unit. Four of those have more than 90 percent of their employees in one departmental unit. Thus, the cross-tabulation shows that more than half the occupational bargaining units are primarily based in one department. This is a function of the distribution of occupations, and it suggests that those six occupational units may not be really independent of the departments. However, only 63 percent of all employees from those six departments were in the occupational unit which the department dominated, with the remaining employees located in other occupational units.

### IMPLICATIONS

The data shown in Tables 1 and 2 support the use of departmental over broad occupational bargaining unit structures. The greater homogeneity of location in departmental over occupational units suggests that bargaining issues relating to urban or rural concerns would be more easily handled and resolved within a departmental structure. The differences in the distribution of the sexes and job levels have implications for affirmative action goals as well as career mobility. These will be more difficult to implement in occupational than departmental units. With several unions, or diverse locals of the same union, representing different occupations,[8] it is less likely that individuals will be able to move freely from one bargaining unit to another. While career mobility for all groups of employees will be affected, it will impact most severely on women because of the high degree of sex segregation in occupational units. The degree of racial and sexual segregation with departmental units does not pose a threat to the career mobility of those groups, because the departments contain both a much greater range of job levels and a significantly greater highest average job level than occupational units. In departmental units therefore, minorities, women, and others will be better able to progress to higher level jobs. They will not be able to move into those higher level positions within occupational units where no such positions exist and, thus, will have to move outside the bargaining unit.

In Michigan, promotions outside the bargaining unit entail a risk to the individual, because the use of seniority for layoff, bumping, and recall is partially controlled by the length of time in the occupational unit, although merit alone is used in making promotions. When an employee takes a promotion within the same department but in a different bargaining unit, that person has much greater exposure to being laid off than he or she would in a position in the same unit. Such a problem would not occur with a departmental unit structure. Thus, in states where the work-force size is subject to cyclical fluctuations of the economy, occupational units are likely to inhibit employee mobility if seniority is applied the way it is in Michigan. If, in addition, seniority within the bargaining unit were a factor in promotions, it would be an even greater hindrance to employee mobility.

In opposition to the interpretation of the findings presented here, one might argue that where differences were found between the two unit structures, they support the greater appropriateness of occupational units. The higher homogeneity of job levels in occupational units could suggest a greater employee community of interest within such units when compared to a more heterogeneous unit structure. Bargaining issues related to narrower classes of employees with similar job tasks could perhaps be more readily settled when dealing with a more homogeneous group of job levels. For example, both Begin and Summers suggested that intraorganizational bargaining problems could result in trying to meet the needs of different occupational groups within a departmental unit.[9] However, Summers has also argued that similar problems exist with occupational units in trying to meet the diverse needs of the different departmental groups. Further, the data in this study have shown how career mobility within the same unit would be much more limited with occupational units. A similar argument could be made that, because occupational units were much more homogeneous by sex, they could more readily handle issues of concern to one sex or the other and therefore be more appropriate. However, one of the major concerns of women today, and indeed of all employees, is career mobility. In addition, a basic tenet of public employment is that it is supposed to provide upward mobility through a career line of jobs.[10] The data again support departmental units over occupational units as more appropriate because of the ease of career mobility within the same bargaining unit.

Further questions about the appropriateness of the change from a departmental structure to an occupational one are raised by the cross-tabulation which found that more than half the occupational bargaining units were dominated by one department. In other states where occupational units are also dominated by one department, they have often become known by the names of their dominant department, e.g., in Illinois, the security and institutional units were commonly referred to as the "corrections" and "mental health" units. The same has happened in Michigan, with the news media referring to "the negotiations in the Michigan Employment Security Commission," rather than in the human service support unit.

One could argue that while some states may claim to have an occupational bargaining unit structure, in reality they have some units dominated by one department and others organized by occupation which are a true interdepartmental mixture. One ramification of this is that where employees from one department constitute a majority of an occupational unit, the interests of employees and management from other departments in that unit may be neglected.[11] This would not be a concern with departmental units.

Another problem is that contract administration is more complicated with occupational than departmental units. For unions it means more departments to deal with and for managers it means more unions. In order to meet the employer efficiency criteria, a two-tier form of bargaining might accompany such departmental units. The pay plan, job classifications, all other economic items, and any other items affecting the budget, such as staffing issues, could be bargained for all state employee bargaining units together.[12] It is recognized that there are potential problems with this approach in that interunit and interunion rivalries may make it difficult to settle economic items. In addition, it may be difficult to make trade-offs between economic and noneconomic items.[13] However, the result in terms of bargaining economic items (but not departmental items) would be quite similar to what is already occurring in states which use pattern-setting or multiple-unit bargaining. It would also be similar to the results in states in which broad coalition bargaining takes place.

The use of a second tier of bargaining at the departmental level would protect the differences in community of interest among the departments from being lost to the forces of centralization. Items affecting individual departments and not having a budgetary impact—certain work rules and procedures, such as vacation scheduling—would be bargained at the departmental level. Because there is only one bargaining unit involved at the local facility level with departmental units, an optional third tier of bargaining could readily take place across all local facilities to handle issues of concern at the work place level far easier than with occupational units. This conclusion is similar to that of Weber that local issues may be better resolved by increasing the degree of decentralization in the bargaining structure.[14]

With the proposed bargaining unit structure, budgetary control would be centralized. Whipsawing would be avoided on economic items. Thus, this structure would readily adapt to the more stringent public sector financial climate of the 1980s as there would be only one set of economic negotiations. This would also facilitate liaison with the legislature concerning budgetary matters for which legislative approval is generally necessary or useful.[15] Departments would still maintain considerable autonomy, and administration of the agreement would generally remain in department hands. Summers has also argued that such tiered bargaining would best serve the interests of both employees and management by facilitating integration of decision making where necessary and allowing diversity where desirable.[16] Weber has spoken highly of this type of solution to resolve similar problems with either industrywide or companywide bargaining in the private sector.[17]

**TABLE 1**

**Relationship of Occupation and Department to Job Level, Sex, Age, Tenure, Location, and Race in the Michigan Civil Service**

| | Percent of variability accounted for by | |
|---|---|---|
| **Variables** | **Occupation** | **Department** |
| Job level | 64.2 | 18.5 |
| Sex | 42.5 | 21.3 |
| Age | 03.9 | 04.0 |
| Tenure | 08.0 | 09.1 |
| Location | 15.2 | 24.2 |
| Race | 03.2 | 14.2 |

**TABLE 2**

**Highest Job Level by Bargaining Unit Type in the Michigan Civil Service**

| | Occupational units | | | | Departmental units | | | |
|---|---|---|---|---|---|---|---|---|
| **Highest job level** | **Number of units** | **Number of employees[a]** | **Cumulative number** | **(%)** | **Number of units** | **Number of employees[a]** | **Cumulative number** | **(%)** |
| 20 | 1 | 4,016 | 4,016 | (7) | 4 | 8,534 | 8,534 | (15) |
| 19 | 0 | | | | 5 | 3,142 | 11,676 | (21) |
| 18 | 0 | | | | 6 | 11,990 | 23,666 | (42) |
| 17 | 2 | 12,600 | 16,616 | (30) | 5 | 19,085 | 42,751 | (77) |
| 16 | 1 | 1,668 | 18,284 | (33) | 3 | 3,291 | 46,042 | (83) |
| 15 | 0 | | | | 2 | 3,184 | 49,226 | (88) |
| 14 | 1 | 2,114 | 20,398 | (37) | 1 | 3,602 | 52,828 | (95) |
| 13 | 0 | | | | 1 | 215 | 53,043 | (95) |
| 12 | 2 | 4,339 | 24,737 | (45) | 2 | 792 | 53,835 | (97) |
| 11 | 2 | 18,753 | 43,490 | (79) | 0 | | | |
| 10 | 1 | 9,540 | 53,030 | (96) | 0 | | | |
| 9 | 1 | 2,203 | 55,233 | (100) | 0 | | | |
| 8 | 0 | | | | 0 | | | |
| 7 | 0 | | | | 0 | | | |
| 6 | 0 | | | | 1 | 1,863 | 55,698 | (100) |
| TOTAL | 11 | 55,233 | | | 30 | 55,698 | | |

a. The number of employees varies because of missing data and because 456 individuals were not assigned to any occupation.

## FOOTNOTES

1. Joel Seidman and Paul D. Staudohar, "The Hawaii Public Employment Relations Act: A Critical Analysis," *Industrial and Labor Relations Review* 26 (April 1973):924. Also see the discussion in Eli Rock, "Bargaining Units in the Public Service: The Problem of Proliferation," *Michigan Law Review* 67 (1969):1005.
2. Clyde W. Summers, "Public Employee Bargaining: A Political Perspective," *The Yale Law Journal* 83 (1974):1190.
3. James P. Begin, "Multilateral Bargaining in the Public Sector: Causes, Effects, and Accommodations," in *Management Handbook for Public Administrators*, ed. John W. Sutherland (New York: Van Nostrand Reinhold, 1978), 900.
4. James L. Perry and Harold L. Angle, "Bargaining Unit Structure and Organizational Outcomes," *Industrial Relations* 20 (Winter 1981):47–59; and Paul F. Gerhart, "Determinants of Bargaining Outcomes in Local Government Labor Negotiations," *Industrial and Labor Relations Review* 29 (April 1976):331–51.
5. Michael L. Moore, "Productivity Improvement in Government: The Effects of Department vs. Occupational Bargaining Unit Structures," *Journal of Collective Negotiations in the Public Sector* 8 (Fall 1979):319–22. Also see Michael L. Moore, Daniel Kruger, and Martin Gilmore, "A Triple Tier Collective Bargaining System for Productivity Improvement in Public Sector Employment Relations," *Journal of Collective Negotiations in the Public Sector* 9 (Winter 1980):1–16.
6. The Department of Labor separated employees involved with employment security, and enlisted state police and highway engineers were also in separate units from the remainder of their respective departments.
7. Hayford and Sinicropi found that more than half the jurisdictions they surveyed gave supervisors either no bargaining rights or less rights than they gave rank-and-file employees. See Stephen L. Hayford and Anthony V. Sinicropi, "Bargaining Rights Status of Public Sector Supervisors," *Industrial Relations* 15 (February 1976):44–62.
8. Four of the eleven bargaining units are represented by the Michigan State Employees Association, an affiliate of the Assembly of Governmental Employees. Two others are represented by the Service Employees International Union, one by the American Federation of State, County and Municipal Employees, three by separate independent employee associations, and one is not represented.
9. Begin, "Multilateral Bargaining," 900; and Summers, "Public Employee Bargaining," 1190.
10. See any typical textbook in public personnel administration. For example, see O. Glenn Stahl, *Public Personnel Administration*, 7th ed. (New York: Harper and Row, 1976), 57–73.
11. For a discussion of this neglect in relations to management, see Milton Derber, Charles Maxey, and Kurt Wetzel, *Public Management's Internal Organizational Response to the Demands of Collective Bargaining in the Twelve Midwestern States* (Washington: U. S. Department of Labor, Labor-Management Services Administration, 1977). For a discussion in relation to employee interests, see Summers, "Public Employee Bargaining," 1192.
12. An alternative to bargaining all economic items uniformly on a statewide basis is the use of what Begin calls "lump sum" budgeting. Here each bargaining unit would receive the same percentage of increase in economic items, Then union and management from each unit could allocate the monies in the different forms of wages, of fringes, and of changes in hours. See Begin, *op. cit.*, pp. 902–903. However, such a form of bargaining is likely to be opposed by civil service commissions because it would promote movement away from uniformity. See Moore, *op. cit.;* and Moskow, Loewenberg, and Koziara, *op. cit.*, p. 103.
13. If there is only one union involved, such trade-offs can be simplifed. See the discussion by Arnold R. Weber, "Stability and Change in the Structure of Collective Bargaining," in *Challenges to Collective Bargaining*, ed. Lloyd Ulman (Englewood Cliffs, N.J.: Prentice-Hall, 1967), 35.
14. *Ibid.*, 28–36.
15. Derber, Maxey, and Wetzel, "Public Management's Response."
16. Summers, "Public Employee Bargaining," 1192.
17. Weber, "Stability and Change," 35–36.

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## GOVERNMENT IN DISTRESS

*(Continued from page 3)*

national norm for spending on higher education; in 1981 it was about 10 percent below the norm.

| | 1979 | 1981 |
|---|---|---|
| Local schools | | |
| Michigan | 5.14 | 5.07 |
| United States | 4.88 | 4.65 |
| Public welfare | | |
| Michigan | 3.03 | 3.06 |
| United States | 2.37 | 2.42 |
| Highways | | |
| Michigan | 1.35 | 1.26 |
| United States | 1.66 | 1.60 |
| Higher education | | |
| Michigan | 1.05 | .95 |
| United States | 1.03 | 1.05 |
| Health and hospitals | | |
| Michigan | 1.01 | .94 |
| United States | 1.03 | .99 |
| All other | | |
| Michigan | 6.72 | 6.55 |
| United States | 6.74 | 6.65 |
| Total | | |
| Michigan | 17.99 | 17.83 |
| United States | 17.71 | 17.36 |

### A LOOK AHEAD

When the *Governmental Finances, 1982–83* report is issued by the Bureau of the Census, it will show that Michigan has continued to decline in the ranking of burden of state taxation. Quite likely it also will reveal slippage in our ranking on local tax burden as well.

Within the state budget, higher education, highways, and health and hospitals have continued to bear the brunt of the budget malaise. Higher education is espe-

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cially vulnerable because it is perceived as having great flexibility to raise operating funds through tuition, fees, and borrowing. Another factor these days is the Headlee Amendment. As it now stands, the state would have to develop ways to send 71 cents to local units of government for each new dollar that it might wish to send to state-owned colleges and universities.

Even as the budget crisis worsens, however, evidence is mounting of a turnaround in the Michigan economy. If the upturn holds, personal income in this state will rise sharply during the January-March 1983 quarter and post good gains in the months beyond. State revenues will increase at a much slower pace because sales tax collections and some other categories tend to lag behind changes in general economic activity. Also, the demand for state services will continue to increase, if for no other reason than the unemployed will continue to exhaust their other resources and join the welfare rolls: those most in need of jobs are not first to be reemployed at the early signs of economic upturn. In other words, in the months ahead there is some evidence of light at the end of the tunnel. Although this year's deficit still will have to be dealt with through further cuts or tax increases, the revenue-expenditure balance should improve by summer, unless the general economic turnaround is nipped by rising interest rates as it was in 1981 and again in 1982. By fall, welfare rolls will be receding, thereby freeing resources for other programs at the same time that revenue is rising. Next year Michigan can begin to repair its damaged state institutions.

### TABLE 1
### State and Local Government Revenues in Michigan and the U.S.: 1979 and 1981

| | Michigan | | | U.S. |
|---|---|---|---|---|
| | Revenues ($ millions) | | | |
| Item | 1979 | 1981 | Percentage change | Percentage change |
| State taxes | | | | |
| Personal income | 1,944 | 2,028 | + 4 | +25 |
| Sales | 1,703 | 1,793 | + 5 | +17 |
| Corporation | 992 | 944 | − 5 | +17 |
| Motor fuels | 507 | 438 | −14 | − 5 |
| Other | 872 | 974 | +12 | +25 |
| TOTAL | 6,018 | 6,177 | + 3 | +20 |
| Local taxes | | | | |
| Property | 3,335 | 4,200 | +26 | +15 |
| Income | 220 | 202 | − 8 | +28 |
| Other | 90 | 103 | +14 | +24 |
| TOTAL | 3,646 | 4,505 | +24 | +18 |
| State aid | 3,069 | 2,901 | − 5 | +20 |
| Federal aid | | | | |
| To states | 2,380 | 2,928 | +23 | +24 |
| To local units | 1,020 | 1,166 | +14 | + 9 |
| Other general fund revenues[a] | 1,686 | 2,368 | +40 | +49 |
| Total revenues[a] | 14,749 | 17,144 | +16 | +22 |

SOURCE: Bureau of the Census, Governmental Finances in 1980–81 (Washington, D.C.: 1982), GF81, No. 5, Table 5; Bureau of the Census, State Government Finances in 1981 (Washington, D.C.: 1982), GF81, No. 3, Table 7, and similar documents for 1979.

a. Excludes current charges for education and hospitals.

### TABLE 2
### State and Local Government Expenditures in Michigan and the U.S.: 1979 and 1981

| | Michigan | | | U.S. |
|---|---|---|---|---|
| | Expenditures ($ millions) | | | |
| Item | 1979 | 1981 | Percentage change | Percentage change |
| Local schools | 4,003 | 4,684 | +17 | +21 |
| Public welfare | 2,363 | 2,827 | +20 | +29 |
| Highways | 1,056 | 1,165 | +10 | +22 |
| Higher education[a] | 821 | 880 | + 7 | +29 |
| Health and hospitals[a] | 791 | 864 | + 9 | +24 |
| Police protection | 620 | 708 | +14 | +22 |
| Interest on debt | 492 | 634 | +29 | +32 |
| Sewerage | 485 | 567 | +17 | +26 |
| Parks and recreation | 469 | 467 | | +25 |
| General control | 401 | 467 | +16 | +23 |
| Corrections | 239 | 330 | +38 | +34 |
| Financial administration | 266 | 292 | +10 | +19 |
| Fire protection | 228 | 268 | +18 | +23 |
| Urban renewal | 130 | 258 | +98 | +50 |
| Social insurance administration | 98 | 148 | +51 | +26 |
| General public buildings | 128 | 130 | + 2 | +14 |
| Regulation | 98 | 111 | +13 | +23 |
| Other | 1,336 | 1,661 | +24 | +20 |
| TOTAL | 14,024 | 16,461 | +17 | +24 |

SOURCE: Bureau of the Census, Governmental Finances in 1980–81 (Washington, D.C.: 1982), GF81, No. 5, Tables 5 and 13, and a similar document for 1979.

a. General expenditure less current charges.

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# The Product Liability Crisis

*by* WILLIAM H. VOLZ, *assistant professor of business law, and* FRED W. MORGAN, *associate professor of marketing, School of Business Administration, Wayne State University*

Michigan's business community experienced a sizable increase in its product liability exposure during the 1970s. Other states were also involved in this product liability "crisis." The United States Commerce Department's Task Force on Product Liability and Accident Compensation reported that the product liability premiums paid by American business increased a staggering 280 percent between 1970 and 1976.[1] Another study showed that insurance companies' revenues from product liability premiums rose from $1.13 billion in 1975 to $2.75 billion in 1978.[2]

Some observers blame the crisis on the growing number of attorneys and on a disturbing disposition of consumers to sue for virtually any product problem.[3] Others point a finger at the state judges who consistently hold business strictly liable for the injuries caused by their defective products.[4]

The data show indisputably that the insurance industry was increasingly exposed to product liability settlements during the 1970s. First, there were many more suits filed. The 158 percent increase in product liability suits in federal courts from 1974 to 1977 is a good illustration.[5] Second, the awards were much larger. The average out-of-court settlement for a bodily injury claim caused by a defective product rose from $6,800 in 1972 to $19,500 in 1974.[6] The average judgment awarded in a product liability trial in 1975 nearly doubled the average award of only five years earlier.[7] Finally, these rising awards were accompanied by rising defense costs. For every dollar paid to a plaintiff, insurance companies paid another thirty-five cents in attorney fees and related costs.[8]

Critics of the insurance industry consistently downplay these facts. They gainsay the higher awards as simply reflecting generally higher health care and labor costs.[9] Some critics maintain that the product liability crisis was a sham conjured up to justify the enormous increases in premium rates.[10] They argue that the premium increases were imposed, not to cover the larger product liability awards, but to recoup serious stock market losses and quite unrelated underwriting losses suffered by the insurance industry during the economic downturn of the mid-1970s.[11] Other critics maintain that the insurance industry's rate-making process is unsophisticated and attribute the higher product liability premiums to "panic pricing."[12]

In most industries the cost of product liability insurance, even with the increased premiums, is less than 1 percent of sales revenues. Yet industries with high-risk products, such as automobile parts, industrial machinery, industrial chemicals, pharmaceuticals, medical devices, and sporting goods, are paying as much as 10 percent of their sales for product liability insurance premiums.[13]

In retrospect, the Michigan legislature faced a product liability crisis whose causes remained a mystery. But the steadily mounting premium costs were a fact. In December 1978 Michigan's legislators cautiously asserted their power to set the parameters for the future product liability decisions of our state's judges. Ironically, the legis-

**Human Resource Implications of Robotics**
**by H. Allen Hunt and Timothy L. Hunt / page 3**

BEST AVAILABLE COPY

lation that was intended to shield Michigan's business from soaring liability premiums eventually became a statute that actually increased their liability exposure.

## RESPONSE OF STATE LEGISLATURES

Michigan and a few other states now require insurers to provide a data base that could justify their ratemaking.[14] Each insurance company offering product liability coverage in Michigan must file a report with the state's insurance commissioner on its state and national experience with both product liability claims and coverage cancellations. These reporting requirements should help to correct a situation in which there "just is no satistical base to provide accuracy in product liability rate making."[15]

Undaunted by this information void, Michigan and twenty-two other states passed product liability legislation in response to the soaring insurance costs. The remarkable variety of these responses demonstrates the vitality of our federal system but not a commitment to uniformity in the American legal environment. Managers should be cautioned that product liability laws vary dramatically from state to state and that some states bar types or classes of claims permitted elsewhere.

## MICHIGAN PRODUCT LIABILITY STATUTE

As the proposed legislation progressed through the House Committee on Economic Development, a parade of lobbyists presented their positions to the legislators. Several earlier versions of the bill were much more favorable to the business and manufacturing communities than the bill finally brought out of committee and eventually enacted into law.[16] The statute that emerged is largely a codification of the product liability law that had already been developed by Michigan's courts, but in several areas our businesses' liability exposure was expanded.[17]

## NATURE OF A PRODUCT LIABILITY CASE

In a product liability case, the plaintiff seeks recovery for a personal injury or property damage caused by a defective product. The plaintiff will usually be a purchaser or user of the product but may simply be a bystander. The defendant will often be the product's manufacturer, but occasionally every seller in the entire chain of distribution will be sued.

Michigan's new statute creates a "product liability action" which encompasses any action, based on any legal theory of liability, brought because of death or injury to a person or for property damage. This injury may be caused by the design, manufacture, testing, or marketing of a product. Michigan's all-inclusive definition of a product liability action incorporates into one form of action those suits which were previously brought under both contract and tort theories. The statute does not explicitly set out the elements necessary to establish a case in this new product liability action. Consequently, Michigan courts will continue to rely on the established laws of warranty and negligence to supply the needed elements.

When someone sues under a contract theory, he or she is usually suing for the breach of a warranty. The injured party must prove that the seller warranted the product, that the warranty was breached, and that the breach caused the injury. The warranty may be either expressed or implied. An express warranty is present when the seller makes "any affirmation of fact or promise to the buyer which relates to the goods and becomes part of the basis of the bargain."[18] For example, if a seller says, "This printer is compatible with an IBM 360 series computer," and it is not, an express warranty has been breached. An implied warranty arises by operation of law without any statement or action by the seller. It is a quality standard created to protect the consumer from defective goods. The implied warranty of merchantability requires that a product "pass without objection in the trade under contract description," and "be fit for the ordinary purposes for which such goods are used."[19] The seller of a watch that loses a half hour per day has breached a warranty, even when no claim of accuracy was made to the buyer.

In the past, plaintiffs could bring a suit for breach of warranty only against those from whom they had purchased the item. Today anyone in the chain of distribution—the manufacturer, the wholesaler, or the retailer—can be sued directly.

When a party sues under a tort theory in Michigan, he or she is alleging negligence or fault. Michigan presently has not adopted the doctrine of strict liability, so the injured plaintiff must show that the manufacturer or seller did not exercise reasonable care in the production or sale of the product. What constitutes "reasonable care" has expanded significantly in recent years. Manufacturers have been found negligent when they failed to test a product for safe performance after extended but foreseeable wear and tear has occurred. A jury could find the manufacturer of a laundromat extractor negligent when the fifteen-year-old machine failed to shut off when the top was raised. Courts have found negligence in a product design when the plaintiff was injured while misusing the product in a foreseeable manner. A screwdriver manufacturer would be liable for an eye injury suffered when the tool was being used to pry open a can of paint.

## STANDARDS OF CONDUCT

An interesting perspective on Michigan's new statute can be gained by comparing the law's final form with the language of the bill while it was being deliberated in the House Committee on Economic Development. There are several instances where the proposed bill made the proof of certain facts by a business a complete defense. Yet the final form says that proof of those facts is merely admissible.

Two good examples are proofs that the conduct of the manufacturer or other seller conformed to "generally recognized and prevailing nongovernmental standards"[20] or "was done pursuant to the federal state law, rules or regulations"[21] which existed at the time the prod-

*(Continued on page 5)*

# HUMAN RESOURCE IMPLICATIONS OF ROBOTICS

*by* H. ALLEN HUNT, *acting manager of research, and* TIMOTHY L. HUNT, *senior research economist, W. E. Upjohn Institute for Employment Research*

This research was sponsored by the Michigan Occupational Information Coordinating Committee (MOICC). Material for this article is taken from a research summary. The final report will be available in March 1983.

A robot is a reprogrammable, multifunctional manipulator. A robot can perform the same task on identical workpieces, repetitively; it can perform multiple tasks on the same workpiece; or it can be reprogrammed to perform entirely new tasks.

The Robot Institute of America (RIA), the trade association of robot manufacturers and corporate users, reports that there were approximately 4,700 robots in the U.S. in 1981. By the end of 1982 we estimate that 6,600 to 7,000 robots will be operating in U.S. factories. We estimate that employment in U.S. robot manufacturing is roughly 2,000 workers nationwide today. This should make it clear that most of the employment impacts to be discussed are in the future. The growth in application of industrial robots and the employment implications of that growth both have to be projected because of the very limited empirical base to date.

Unlike R2D2 and C3PO of the movie *Star Wars*, robots of today are essentially "dumb machines." They are generally immobile; they usually lack any visual or tactile sensor perception, and therefore cannot adapt to their environment in any way. Generally they are no faster than human workers, but they are tireless. In layman's trms that means a robot can reproduce a specific range of motions for which it has been programmed, but it does not know if it is really holding the part it is supposed to be or if the work was done correctly. Although the trade literature makes much of the reprogrammability of robots, few robots are truly reprogrammed.

The proven applications of robots today are welding, painting, and various pick-and-place operations. Assembly robots are viewed as the number one growth application of the future, but presently robots cannot perform most assembly tasks with consistency in an industrial environment at a reasonable cost. Given all of the media attention to robots, it is surprising that there are so few actually in operation. Part of the reason is to be found in the limited industrial applications so far developed.

Virtually all robots can be found in manufacturing firms, and the bulk are located in what is sometimes referred to as the metalworking sector. The auto industry is the primary user of robots today with approximately 25 percent of all robot installations. Again, the surprise is that so few industries are actually using robots, but is it also true that these heavy industries are particularly concentrated in the traditional industrial heartland of the five Great Lakes States.

Robots should be viewed as a capital investment in automated equipment. In terms of cost, flexibility, and capability, robots are actually a compromise between the extremes of custom production and dedicated automation. Set-up time for a robot far exceeds that of a human operator in custom production, yet the speed of a robot is no match for dedicated automated equipment. Likewise, robots are no match for the flexible skills of a precision machinist, nor can a robot repeat a single task as perfectly as highly specialized automated equipment. In view of these facts, robots today are being applied in semi-automated batch or mass production facilities where the human worker or the type of work itself already limits the speed of the overall facility. The robot, once installed, appears to be just one more piece of dedicated automated equipment.

In the future such production facilities may be computer controlled with robots moving the workpiece from machine to machine. If an entire "production cell' is computer controlled, then human workers will not be needed except for maintenance, provision of the necessary material inputs, and transportation for the final output. If off-line reprogramming capability becomes available, then human operators will not even be needed to switch to the next batch. Such "flexible automated systems" will ultimately be linked together and lead to the completely automated factory of the future.

## ROBOT POPULATION IN 1990

The projections of occupational impact in this study are the result of first forecasting the U.S. robot population by industry and application areas within those industries. This approach constrains the employment impacts to reflect the actual expected sales of robots. In this way a consistent economic framework is established within which it is possible to estimate not only the population of robots and job displacement but also the job creation resulting therefrom. The consistency is also very helpful in avoiding unrealistic conclusions.

Our data were gathered from published sources and through interviews with robot manufacturers, corporate users of robots, and other experts. While some judgment was undeniably necessary, we attempted to maintain objectivity throughout our efforts. In the full study, all judgments and assumptions are explicitly stated and, thus, are available for review. However, due to the space limitations of this summary, emphasis is on concusions father than methodology.

We expect strong growth in the utilization of industrial robots in the decade of the 1980s. By 1990 the total robot population in the U.S. will range from a minimum of 50,000 to a maximum of 100,000 units. Given our estimate of the year-end 1982 population of approximately 6,800 units, that implies an average annual growth rate of between 30 and 40 percent for the eight years of the forecast period, or roughly a seven- to fourteen-fold increase in the total population of robots.

*(Continued on page 6)*

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# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 39.7 | 39.8 | 40.7 (Nov.) |
| Average weekly hours, U.S. | 39.9 | 39.0 | 39.2 (Nov.) |
| Average hourly earnings, Michigan ($) | 10.86 | 11.12 | 11.22 (Nov.) |
| Average hourly earnings, U.S. ($) | 8.27 | 8.56 | 8.62 (Nov.) |
| U.S. motor vehicle production (units) | 535,328 | 556,457 | 530,296 (Nov.) |
| Michigan electricity usage (mil. kwh.): | | | |
| Industrial (mil. kwh.) | 2,721 | 2,490 | 2,446 (Aug.) |
| Residential (mil. kwh.) | 1,940 | 1,829 | 1,836 (Aug.) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 590 | 413 | 360 (Nov.) |
| United States (000 net tons) | 7,962 | 5,262 | 4,546 (Nov.) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 279.1 | 295.2 | 296.0 (Nov.) |
| United States | 279.9 | 294.1 | 293.6 (Nov.) |
| U.S. producer price index (1967 = 100) | 295.5 | 299.2 | 300.4 (Nov.) |
| Michigan farm prices received index (1977 = 100) | 129 | 115 | 116 (Nov.) |

SOURCE: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administraton.

# Contracts for Future Building, Cumulative: 1981 and 1982

(Thousands of Dollars)

| | Nonresidential | | | Residential | | | Total[a] | | |
|---|---|---|---|---|---|---|---|---|---|
| Area | 1981 | 1982 | Percentage Change | 1981 | 1982 | Percentage Change | 1981 | 1982 | Percentage Change |
| Ann Arbor | 55,692 | 72,400 | + 30 | 32,917 | 19,267 | − 41 | 88,609 | 91,667 | + 3 |
| Battle Creek | 16,130 | 48,764 | +202 | 14,210 | 10,430 | − 27 | 30,340 | 59,194 | + 95 |
| Bay City | 9,731 | 7,736 | − 21 | 6,409 | 7,845 | + 22 | 16,140 | 15,581 | − 3 |
| Detroit | 727,472 | 511,253 | − 30 | 328,102 | 316,754 | − 3 | 1,055,574 | 828,077 | − 22 |
| Flint | 40,199 | 44,169 | + 10 | 35,940 | 26,081 | − 27 | 76,059 | 70,250 | − 8 |
| Grand Rapids | 126,207 | 124,288 | − 2 | 123,956 | 78,199 | − 37 | 250,163 | 202,407 | − 19 |
| Jackson | 18,797 | 7,309 | − 61 | 17,118 | 8,851 | − 48 | 35,915 | 16,160 | − 55 |
| Kalamazoo-Portage | 45,836 | 135,950 | −197 | 81,967 | 32,483 | − 60 | 127,803 | 168,433 | + 32 |
| Lansing-East Lansing | 60,175 | 46,929 | − 22 | 93,549 | 41,868 | − 55 | 153,724 | 88,797 | − 42 |
| Muskegon-Norton Shores-Muskegon Heights | 14,396 | 23,981 | + 76 | 23,413 | 14,321 | − 39 | 37,809 | 38,302 | + 1 |
| Saginaw | 16,371 | 22,167 | + 35 | 21,616 | 15,896 | − 26 | 285,133 | 238,877 | − 16 |
| Toledo | 150,857 | 139,626 | − 7 | 134,276 | 99,251 | − 26 | 37,987 | 38,063 | + 0.2 |
| Michigan | 1,336,850 | 1,149,956 | − 14 | 1,122,958 | 856,444 | − 24 | 2,459,808 | 2,006,400 | − 18 |
| United States | 60,087,700 | 59,207,500 | − 1 | 60,164,000 | 58,076,300 | − 3 | 120,251,700 | 117,283,800 | − 2 |

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

Note: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing-East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; Muskegon-Norton Shores-Muskegon Heights includes Muskegon and Oceana counties; and Toledo includes Monroe County, Michigan, and Fulton, Lucas, Ottawa, and Wood counties, Ohio.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1981 and 1982 figures for nonbuilding construction contracts were $798,406,000 and $482,218,000 respectively, or a decrease of 40 percent. For the United States they were $33,227,900,000 and $37,335,600,000 respectively, or an increase of 12 percent. Total building and nonbuilding construction contracts declined by 24 percent in Michigan and increased 1 percent nationwide.

## THE PRODUCT LIABILITY CRISIS

*(Continued from page 2)*

uct was sold. Under the initial language, proof that an extension cord conformed to the quality of Underwriters Laboratories would have barred a suit against the manufacturer or a retailer. Under the new law, this evidence simply "shall be admissible." Consumer groups, the State Bar of Michigan, and the Michigan Trial Lawyers Association, the formidable lobby of plaintiffs' attorneys, apparently convinced the legislators that an industry should not be allowed to define its own standard of conduct. The implications is that without an "outsider's" view the industry or trade associations would perpetuate substandard, unsafe technologies.[22] The statute gives those making or selling a product no assurance that meeting industry safety standards will foreclose liability. Instead, the statute promotes litigation as a mechanism to prod a company into spending substantial amounts of money to develop only marginally safer products simply to provide some modicum of assurance that they will not be found liable.

Similarly, meeting a government safety standard provides a business with only minimal protection. Evidence that a product met the relevant governmental standard is admissible at the trial but is not a defense. The legislation allows a court to hold an automobile manufacturer to a higher safety standard than the standard thought appropriate by the state or federal regulatory agency that presumably has an expertise in this product. The agencies are apparently thought to be held captive by those they purport to regulate. Perhaps the legislature was leery of the heavy reliance of the regulators on technical input from industry sources.[23] But the bottom line is that the legislature allows the judiciary to second-guess the safety standards set by the executive branch's regulatory agencies. Meeting and even exceeding the product safety standards set by the industry or the government will not bar a business from being held liable.

### STATE OF THE ART

Advocates of Michigan's business community presented the House Committee on Economic Development with a bill that would have barred evidence of a change in technology introduced after the initial sale of the product. These "state of the art" statutes have two pur[illegible] First, the barring of evidence of a subsequent [illegible]ement reinforces those managers seeking to use [illegible]er technology as the change cannot be used to [illegible] the quality of their older product line. Seco[illegible]s a fairness notion that is offended when we ho[illegible]usiness to a subsequently developed, higher technological standard that was not reasonably feasible or was simply unknown at the time the product was designed.

Interestingly, even the business supporters would have settled for a standard based on the technology at the date of the initial sale, not at the earlier time the product was designed. The new statute only bars evidence of change in technology occurring after the date of the injury.[24] This difference between the "date of the sale" and the "date of the injury" appears subtle, but the impact can be devastating to a jury's perception of a defendant.[25] For example, assume that an automaker were to develop "bendable glass" *after* the sale of the car involved in a serious facial injury but *before* the accident occurred. That new development would be admitted to assist the jury in deciding if the auto's glass had a defective design. Michigan has a sizable group of plaintiffs' attorneys who will make excellent use of this expanded body of admissible evidence.

### WARNINGS

The initial bill stated that the presence of a warning which gave notice to a user of a product's dangers would be a defense if the user ignored the warning and was injured. The enacted law states that the presence of the warning is merely admissible evidence.[26]

### STATUTES OF LIMITATION AND REPOSE

A statute of limitation establishes a time limit from the date the action accrues within which a suit must be brought. The legislature rejected a proposal for a six-month limit in favor of three years.[27]

A statute of repose bars a suit for an injury from a very old product. The final language did not contain a statute of repose. Some manufacturers contend that the present law requires a design where all the product's parts collapse at once. A fifteen-year-old laundromat extractor that is still running strong can mean potential liability if the shut-off mechanism no longer works when the top is raised.

### COMPARATIVE NEGLIGENCE

The new product liability act introduced the plaintiff-oriented theory of comparative negligence into Michigan law.[28] Two months after the legislature ushered in comparative negligence, the theory was embraced by the Michigan Supreme Court in the landmark decision of *Placek v. City of Sterling Heights.*[29]

Before comparative negligence became the law of Michigan, if a plantiff was injured, in part because of negligence, contributory negligence would bar recovery. The new statute provides that the damages suffered by the plaintiff shall be diminished in proportion to the amount of negligence attributed to the plaintiff. If a careless worker is injured by negligently designed safety equipment on a drill press, carelessness will no longer bar recovery. If one-third of the negligence can be attributed to carelessness, recovery will be accordingly reduced. Today, this plaintiff would receive two-thirds of damages; in the past, nothing.

### CONCLUSION

Legislation was introduced in response to the complaint of manufacturers and other businesses that they were paying exorbitant rates for their product liability insurance or having difficulty in obtaining the insurance coverage at all. Eventually, the fanfare died down, the voters were counted, and what emerged was a very different body of law than originally proposed. If the product liability premiums paid by Michigan businesses level off or begin to drop, the new product liability statute almost certainly will not have been the cause.

### Footnotes

1. U.S. Dept. of Commerce, *Interagency Task Force on Product Liability Final Report (1977)*, III-11 (hereinafter cited as *Task Force Report*).
2. "The Devils in Our Product Liability Laws," *Business Week*, 12 February 1979, 72.
3. "When Firms Get Sued for 'Faulty' Goods," *U.S. News and World Report*, 22 May 1978, 93; National Association of Manufacturers, *Issue Brief on Products Liability*, 1 February 1982, 1.
4. "Devils in Our Laws," 72.
5. The Research Group, Inc., Interagency Task Force on Product Liability, *Final Report on the Legal Study (1977)*, 1:10.
6. McKinsey & Company, Inc., Interagency Task Force on Product Liability, *Final Report of the Insurance Study (1977)*, 4.
7. The Research Group, Inc., Interagency Task Force on Product Liability, *Final Report of the Legal Study (1977)*, 3:4.
8. Insurance Services Office, *Product Liability Closed Claim Survey: A Technical Analysis of Survey Results (1977)*, 11.
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10. Johnson, "Behind the Hype on Product Liability," *The Forum* 14 (Fall, 1978): 317, 324; Birnbaum, "Legislative Reform or Retreat? A Response to the Product Liability Crisis," *The Forum* 14 (Fall, 1978): 251, 255.
11. Begam, "Crisis," 47; House Committee on Small Business, Product Liability Insurance," H.R. Report No. 997, 95th Congress, 2d Session (1978), remarks of Ralph Nader.
12. *Task Force Report*, I-22; *Summary*, 12.
13. *Task Force Report Summary*, 12.
14. Mich. Comp. Laws §500.438 (1976).
15. Ghiardi, *Products Liability—Where is the Borderline Now?, The Forum* 13 (Fall, 1977): 206, 210.
16. Schaden, "Product Liability: Synthetic Crisis, Defective Cure," *Michigan State Bar Journal* (January, 1978): 26.
17. Mich. Comp. Laws §600.2945–600.2948, §600.-5805, 600.5827, 600.5833 (1978).
18. Mich. Comp. Laws §400.2313(1)(a) (1972).
19. Mich. Comp. Laws §400.2314(2)(a) and (c) (1979).
20. Mich. Comp. Laws §600.2946(1) (1978).
21. Mich. Comp. Laws §600.2946(2) (1978).
22. Schaden, "Product Liability," 27.
23. Ibid., 28.
24. Mich. Comp. Laws §600.2946(3) (1978).
25. Basta, "Michigan's New Product Liability Law," *The Detroiter*, (February, 1981): 9.
26. Mich. Comp. Laws §600.2948 (1978).
27. Mich. Comp. Laws §600.5805(9) (1978).
28. Mich. Comp. Laws §600.2949(1) (1978).
29. *Placek v. City of Sterling Heights*, 405 Mich. 638 (1979).

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## IMPLICATIONS OF ROBOTICS

*(Continued from page 3)*

This range is intended to contain the actual robot population with a high probability level, and allows for variation in interest rates, capital investment climate, auto industry recovery, and rate of economic growth. We are confident this range will contain the 1990 robot population. That means we do not expect the total collapse of the automobile industry, a major renaissance in U.S. capital investment, the early development of non-manufacturing robot applications, or the widespread adoption of robotics technology by small firms.

The U.S. population of robots is developed separately for the auto industry and all other manufacturing. This is partly to take advantage of the fact that the auto producers have announced goals for robot installations which could be factored into our robot population forecast. It also reflects the fact that the major impact of robots in the State of Michigan will be in the auto industry. Our forecast of the robot population sees 15,000 to 25,000 robots employed in the U.S. auto industry by 1990.

The Michigan robot population in 1990 is derived from the U.S. total by assigning the robots in proportion to production worker employment, both in the auto industry and in all other manufacturing. The result is a forecast of roughly 7,000 to 12,000 robots in Michigan in 1990. Somewhere between 5,000 and 9,000 of these will be employed in the auto industry, roughly three-fourths of the total. Consequently we conclude that, outside the auto industry, robots will have only a minor impact in the State of Michigan during the forecast period.

### GROSS CUMULATIVE DISPLACEMENT EFFECTS BY 1990

Before discussing the displacement effects of robots, it is important to insure that the meaning of the term "displacement" is clear. We use displacement to refer to the elimination of particular jobs, not to the layoff of individual workers. It clearly is possible that the displacement of a particular job by a robot might lead to the layoff of the occupant of that job, but it is not necessary. Layoff refers to the involuntary separation of the worker from the firm; displacement refers to the elimination of the job itself without any assumption as to whether the worker in that job is separated from the firm, either voluntarity or involuntarily.

Utilizing the Michigan robot forecast by industry, and the assumption of a gross displacement rate of two jobs per robot which was strongly supported in our interviews, estimates of gross job displacement are derived. We estimate that robots in Michigan will eliminate between 13,500 and 24,000 jobs by 1990. Between 10,500 and 18,000 of these will be in the auto industry, while 3,000 to 6,000 non-auto jobs will also be eliminated. In relative terms, over 75 percent of the job losses in Michigan are expected to be in the auto industry.

In addition to the assignment of robots by location and industry, it was necessary to forecast the applications for which they will be used. This is required if the robot population forecast is to be useful in predicting occupational displacement. Otherwise there is no way to connect the robots with the work content of specific jobs. The application areas used in this study are welding, assembly, painting, machine loading and unloading, and other.

When the robot forecast by application area and industry is matched against an occupational data base similarly organized, specific occupational displacement rates can be derived, as illustrated in table 1. Although the overall job displacement rate of 1.1 to 2.0 percent through 1990 is not particularly problematical, specific industry and occupation displacement rates are very significant, even dramatic.

To begin with, the displacement rate derived for the auto industry in Michigan ranged from 2.6 to 4.3 percent of all employment. But when displacement was calculated only against the operatives and laborers in the auto industry, the magnitude of displacement was from 5.1 to 8.6 percent. Even when considered to be over a period of a decade, these rates of job displacement *are* significant.

When specific occupational displacement rates are calculated, even more striking results emerge. Our results suggest that between 15 and 20 percent of the welders in the auto industry will be displaced by robots by 1990. Even more dramatically, between 30 and 40 percent of the production painter jobs in the auto industry will be eliminated by 1990. While displacement results are generally less significant for specific occupations in all other manufacturing, it is still projected that 6 to 10 percent of the production painter jobs will be lost here in the same time frame.

The conclusion of the job displacement estimates is that while job displacement due to robots will not be a general problem before 1990, there will clearly be particular areas that will be significantly affected. Chief among these will be the painting and welding jobs for which today's robots are so well adapted. Lesser impacts will be apparent on metalworking machine operatives and assemblers.

We do not believe that this job displacement will lead to significant job loss among the currently employed, however. Even in the auto industry, voluntary turnover rates historically have been sufficient to handle the reduction in force that might be required. In addition, the new General Motors-United Auto Workers contract seems to provide adequate job security assurances, and the retraining commitment necessary to back them up. Thus we do not expect any substantial number of auto workers to be thrown out of work due to the application of robots. Any unemployment impact is likely to be felt by the labor market entrants who will find more and more factory gates closed to the new employee.

## JOB CREATION IN MICHIGAN BY 1990

Unquestionably, the most surprising finding is that slightly over two-thirds of the workers in robot manufacturing are in the traditional "white collar" areas of professional, technical, administrative, sales and clerical workers; while only one-third are in the traditional "blue colar" areas of skilled craft workers, production operatives, and laborers. To some extent that is simply a reflection of a young high technology industry with low sales, where the firms tend to be assemblers with little fabrication of parts. However, it is also indicative of a product that cannot be sold like a loaf of bread; there are significant requirements for engineering design, programming and installation for *each* specific application.

By 1990 we foresee the direct creation of from 5,000 to 18,000 jobs in Michigan in four broad areas: robot manufacturing, direct suppliers to robot manufacturers, robot systems engineering, and corporate robot users (auto and all other manufacturing). The jobs in corporate robot users identify maintenance requirements for robots, while the jobs in robot systems engineering identify the applications engineering requirements for robot systems, without regard to industry of employment.

The range of uncertainty is wide in the case of job creation because, in addition to the question of the robot sales level, there is also a question of Michigan's share in robot production in 1990. We attempted to bracket that figure as we did earlier with the robot population. In the case of robot production, our projected Michigan range is from 20 to 40 percent of U.S. production. In 1981 robot manufacturers with Michigan production facilities accounted for nearly one-fifth of the approximately $150 million in U.S. sales of robots.

**TABLE 1**
**Displacement Impact of Robots in Michigan by Application, Cumulative 1978 to 1990**

| | Autos | | All other manufacturing | | Total | |
|---|---|---|---|---|---|---|
| Application | 1978 employment level | Displacement range (percent) | 1978 employment level | Displacement range (percent) | 1978 employment level | Displacement range (percent) |
| Welding | 14,910 | 15.2–19.5 | 22,694 | 2.0– 3.6 | 37,604 | 7.2– 9.9 |
| Assembly | 65,764 | 4.5– 9.5 | 50,678 | 0.8– 2.4 | 116,442 | 2.9– 6.4 |
| Painting | 4,378 | 29.2–40.6 | 4,387 | 6.0–10.3 | 8,765 | 17.6–25.4 |
| Machine loading/unloading | 42,149 | 8.4–13.5 | 86,906 | 1.7– 3.2 | 129,055 | 3.9– 6.6 |
| All operatives and laborers | 205,927 | 5.1– 8.6 | 397,598 | 0.7– 1.5 | 604,525 | 2.2– 4.0 |
| All employment | 409,506 | 2.6– 4.3 | 769,841 | 0.4– 0.8 | 1,179,347 | 1.1– 2.0 |

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# The Automotive Economy

*by* DAVID I. VERWAY, *Director, Bureau of Business Research, School of Business Administration, Wayne State University*

In January of this year Buick Motor Division of the General Motors Corporation announced "Buick City," a renovation that will replace one Fisher Body plant and two Buick assembly lines, together capable of producing one hundred vehicles per hour, with one rated at seventy-five per hour. Buick will emphasize to suppliers who are not already there the importance of having nearby plants to take advantage of "just-in-time" production of passenger cars.

Just-in-time, or kanban, the Japanese term for the same phenomenon, is a system of careful coordination and close monitoring so as to minimize the accumulation of materials and components between machines, stations, or factories in the production process. A leaner work-in-process inventory reduces the amount of a loan required to finance it. Such loans, a part of so-called working capital, have become major costs in these days of high interest rates. This is especially true in the automotive industry where manufacturers are accustomed to hedging against supply disruptions by stockpiling several days' or even weeks' parts inventory. These large "floats" reflect a make-do mentality rather than "let's get it right," an attitude that evolved out of the need to meet ever expanding demand in the face of slowly rising capacity during the 1960s and early 1970s. In this helter-skelter of matching demand with supply, producers also relaxed their quality control on suppliers. Besides reducing carrying costs, the switch from "just-in-case" to just-in-time will give rise to earlier detection of flaws and better quality control inasmuch as defective parts will not accumulate.

The Flint, Michigan, plant, which now makes rear-drive Buicks in the traditional body-chassis configuration, will make front-drive, unitized-body GM passenger cars beginning fall 1984 (1985 model year). In Lansing, Michigan, Oldsmobile will convert its two assembly lines to the production of front-drive N cars for the 1985 model year. The two lines, each rated at fifty cars per hour, will make Oldsmobiles, Buicks, and Chevrolets. N cars will be sourced exclusively from Lansing. At Lake Orion this fall, the larger, front-drive Cadillacs and the Oldsmobile 98 will roll out of a new factory at a rate of seventy per hour. A now idle assembly line in Pontiac will produce the new Pontiac Fiero. By fall 1985 GM's new Detroit-Hamtramck factory will be making downsized Cadillac Eldorados and Sevilles, Oldsmobile Toronados, and Buick Rivieras, now sourced at Linden, New Jersey. Meanwhile, the Clark Avenue (Detroit) Cadillac plant will continue to produce rear-drive Cadillacs and will start to make rear-drive Oldsmobile 88s as well. The only GM car assembly plant in Michigan not scheduled for major change at this time is the one at Willow Run, near Ypsilanti, where the GM Assembly Division makes Buick Skylarks and Olds Omegas.

Under current planning, during the 1986 model year 34 percent of GM's rated U.S. capacity to produce passenger cars will be located in Michigan. Whether Michigan plants actually produce 34 percent of GM cars will depend on market conditions for the various makes and models produced here and elsewhere.

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Ford has announced no recent change in its automobile production capacity, other than the closure of its plant in San Jose, California. Michigan with car assembly plants in Dearborn, Wayne, and Wixom will have 33 percent of Ford's production capacity during the 1986 model year.

Chrysler Corporation, with assembly plants in Detroit; Newark, Delaware; Belvidere, Illinois; and Fenton, Missouri, has a capacity shortage. Its immediate plans include purchase of an idle plant in Sterling Heights, Michigan, where it will produce the new H car. For the 1986 model year Michigan will contain 36 percent of the U.S. passenger car production capacity of the Chrysler Corporation.

As matters now stand, 32 percent of this nation's car assembly capacity will be located in Michigan by fall 1985. Details of Chrysler, Ford, and GM capacity, along with the AMC, VW, and Honda figures, are shown in Table 1. Excluded are tiny producers such as Avanti (South Bend) and Excalibur (Milwaukee). The table does list the Canadian assembly plants for the major passenger car producers, however, because they are integral parts of their North American operations. Michigan is a top exporter of manufactured products as a consequence of our access to the Canadian market for assembled vehicles as well as intermediate components.

## MICHIGAN'S PRODUCTION PROGNOSIS

At best, the U.S. auto industry will be capable of comfortably producing about 11.5 million 1986 model automobiles, given the capacity that will be available under the assumptions in Table 1. Michigan could assemble about 3.7 million, or 32 percent of that total. Since in the best previous year (1973) the United States produced 9.7 million cars and Michigan produced 3.3 million, and given the condition of demand for North American vehicles in the foreseeable future, it seems unlikely that either the United States or Michigan 1986 potential will be realized. The year 1986, it is assumed here, is the next peak production year for the North American automobile industry.

The Bureau of Industrial Economics of the U.S. Department of Commerce, looking ahead in its *1983 U.S. Industrial Outlook*, envisages retail sales of domestic new cars of 7.9 million during 1987, an increase of less than 40 percent over the 5.7 million for 1982. The 1982 figures reflect net imports of about 600,000 units from Canadian plants of Canadian-U.S. companies. The Commerce forecast is consistent with U.S. production of about 7 million automobiles during 1986 and with overseas import sales of about 30 percent of the U.S. market.

If the Commerce prognosis is borne out, if U.S. carmakers can find markets for only two-thirds of their capacity, they are unlikely to maintain that productive ability. Capacity would be cut to, say, 9 million annual production in this country. Michigan would produce about 2.45 million automobiles or 35 percent of the 7 million U.S. total. Michigan's share would increase with capacity reduction because most of the cuts would occur in the more distant plants from the industrial heartland. As a matter of fact, except for Chrysler Corporation which had allowed its Hamtramck and Lynch Road plants to become decrepit, recent closures have taken place at the perifery in California and New Jersey. Plants not permanently closed but not currently in operation are located in Georgia and California. Plants that would seem to be logical candidates for closure in a permanent shrinkage are located in California, Massachusetts, New Jersey, Delaware, Texas, New York, Illinois, and Michigan. In short, in a worst-case scenario Michigan stands to gain an increasing share of a diminished industry. To economize, companies would tend to close their plants most distant from suppliers concentrated in the industrial heartland around the Great Lakes. Another reason is that the imports are most popular in the more distant markets. Assembly plants in California, for example, have had to search for ever more distant inland markets as the import share has increased. It is more economical to assemble cars in Michigan than to send components from the midwest to California for assembly into cars destined for markets in Colorado for example.

In assessing Michigan's automotive future it seems important to focus on the kinds of vehicles that will be produced here. In Detroit, Wixom, Sterling Heights, and Lake Orion Township we will have about two-thirds of the U.S. capacity to make luxury vehicles. After a decade of obsession with downsizing and with meeting various government constraints, Detroit again is abuzz with styling, performance, and engineering, particularly in the upper echelons of the market. This segment promises to be the fastest growing within the domestic product lineup since, by 1986, one in seven U.S. households will have annual incomes of $50,000 or more. That compares with one in fourteen in 1981, and one in sixty in 1976.

## TRUCKS

Chrysler makes small trucks (Rampage and Scamp) in Belvidere, Illinois. Pick-ups, vans, and its sport-utility Ramcharger are made in Warren, Michigan, locale of about 80 percent of its U.S. truck-making capacity. Ford makes its larger Bronco as well as light duty trucks in Wayne, Michigan; about 14 percent of Ford truck capacity is located here. GM has about 46 percent of its truck capacity — ranging from its new, small S truck to heavy duty semitractors — in its Detroit, Flint, and Pontiac plants. International Harvester, Mack, and other producers have no Michigan plants. All told, in 1986 Michigan will have about a third of U.S. capacity to produce trucks. Assuming the worst, that in 1986 the U.S. industry will be producing trucks at the same level as it did in 1976, and assuming that only 30 percent of those vehicles are Michigan made, this state will produce about 900,000 units, 56 percent above the 1982 rate and well below the 1973 and 1978 levels.

All GM buses are produced in Pontiac. This state has no other bus plants. Because of the growth in number of producers in this country, it is difficult to calculate Michigan's future share.

In summary, Michigan's share of U.S. vehicle production will very likely continue to exceed 30 percent. Production of 3.4 million cars, trucks, and buses in this state at the next peak is well within reason. Production

# TABLE 1

## Details of Passenger Car Production in United States and Canadian Assembly Plants

| State | City | Company | Line speed[a] | Model[b] | Production[c] |
|---|---|---|---|---|---|
| | | | **UNITED STATES** | | |
| **Michigan** | Dearborn | Ford | 50 | Mustang, Capri | 160,075 |
| | Detroit | Chrysler | 60[d] | Reliant, Aries, Dodge 400, Dodge 600, LeBaron, Chrysler E, Caravelle[e] | 176,384 |
| | | GM | 45 | Cadillac[f] | 156,618 |
| | Detroit-Hamtramck[g] | GM | 70[d] | | — |
| | Flint | GM | 100[h] | Regal, LeSabre, Electra | 286,937 |
| | Kalamazoo | Checker | n.a. | Checker | 2,000[i] |
| | Lake Orion[j] | GM | 70[d] | | — |
| | Lansing | GM | 120 | Cutlass Supreme,[k] Olds 88, Olds 98 | 442,058 |
| | Pontiac[l] | GM | 60[d] | | 106,846 |
| | Sterling Heights[m] | Chrysler | 60[d] | | — |
| | Wayne | Ford | 66 | Escort, Lynx | 204,438 |
| | Wixom | Ford | 33 | Lincoln, Mark VI, Continental | 97,620 |
| | Ypsilanti | GM | 63 | Skylark, Omega | 184,962 |
| State Total | | | 772[n] | | 1,817,934 |
| **Missouri** | Leeds | GM | 54 | Skyhawk, Firenze | 106,186 |
| | Kansas City | Ford | 50 | Fairmont, Zephyr | 160,637 |
| | St. Louis | Ford | 36[p] | Grand Marquis | 90,438 |
| | Fenton | Chrysler | 90[p] | LeBaron, 400, Reliant, Aries, Caravelle | 101,448 |
| | Wentzville[q] | GM | 70[d] | | — |
| State Total | | | 264 | | 458,709 |
| **Delaware** | Wilmington | GM | 70 | Chevette, Acadian | 198,578 |
| | Newark | Chrysler | 60 | Aries, Reliant, LeBaron, Wagon | 170,242 |
| State Total | | | 130 | | 368,820 |
| **Georgia** | Doraville | GM | 60[d] | Century, Ciera | 219,220 |
| | Lakewood | GM | 60[r] | Chevette, T1000 | 54,669 |
| | Atlanta | Ford | 50 | LTD, Marquis, T-bird | 60,776 |
| State Total | | | 170 | | 334,665 |
| **California** | Van Nuys | GM | 54 | Camaro, Firebird | 205,490 |
| | South Gate[s] | | | | 10,512 |
| | Fremont | GM | 60[d] | | 12,957[t] |
| | San Jose[u] | Ford | | EXP, LN7, Escort, Lynx | 68,783 |
| State Total | | | 114 | | 297,742 |
| **Illinois** | Chicago | Ford | 50 | LTD, Marquis | 140,357 |
| | Belvidere | Chrysler | 60 | Horizon, TC3, Omni, 024, Rampage, Scamp | 150,028 |
| State Total | | | 110 | | 290,385 |
| **Ohio** | Lordstown | GM | 70 | Cavalier, J2000 | 95,042 |
| | Norwood | GM | 42 | Camaro, Firebird | 136,418 |
| | Lorain | Ford | 60 | T-Bird, X-R7 | 39,926 |
| | Marysville | Honda | 60 | Accord | — |
| State Total | | | 232 | | 271,386 |
| **New Jersey** | Linden | GM | 45 | Riviera, Toronado, Eldorado, Seville | 158,304 |
| | Edison | Ford | 53 | Escort, Lynx | 81,024 |
| State Total | | | 98 | | 239,328 |
| **New York** | Tarrytown | GM | 60 | Citation, Phoenix, Skylark | 176,642 |
| **Texas** | Arlington | GM | 56 | Malibu, Monte Carlo, Regal | 164,863[v] |
| **Kansas** | Fairfax | GM | 60 | Buick, Olds, Chevrolet | 158,298 |
| **Wisconsin** | Janesville | GM | 60 | Cavalier, Cimarron | 43,001 |
| | Kenosha | AMC | 60 | Spirit, Concord, Eagle, Alliance | 109,549 |
| State Total | | | 120 | | 152,550 |
| **Maryland** | Baltimore | GM | 60[w] | Malibu, Monte Carlo, Grand Prix, Bonneville | 107,925 |
| **Pennsylvania** | New Stanton | VW | 60 | Rabbit | 84,246 |
| **Oklahoma** | Oklahoma City | GM | 75 | Citation, Century, Celebrity | 79,109 |
| **Massachusetts** | Framingham | GM | 45 | Celebrity, 6000 | 74,886 |

**THE MICHIGAN ECONOMY**

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# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 40.5 | 40.7 | 41.3 (Dec.) |
| Average weekly hours, U.S. | 39.9 | 39.3 | 39.7 (Dec.) |
| Average hourly earnings, Michigan ($) | 443.67 | 454.00 | 466.11 (Dec.) |
| Average hourly earnings, U.S. ($) | 329.97 | 338.37 | 344.99 (Dec.) |
| U.S. motor vehicle production (units) | 279,824 | 383,604 | 432,756 (Jan.) |
| Michigan electricity usage (mil. kwh.): | | | |
| Industrial (mil. kwh.) | 2,444 | 2,251 | 2,099 (Nov.) |
| Residential (mil. kwh.) | 1,634 | 1,592 | 1,635 (Nov.) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 612 | 360 | 448 (Dec.) |
| United States (000 net tons) | 7,671 | 4,546 | 4,456 (Dec.) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 278.3 | 296.0 | 292.6 (Dec.) |
| United States | 281.5 | 293.6 | 292.4 (Dec.) |
| U.S. producer price index (1967 = 100) | 275.4 | 284.9 | 285.1 (Dec.) |
| Michigan farm prices received index (1977 = 100) | 135 | 116 | 116 (Dec.) |

SOURCE: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administraton.

**TABLE 1 (Continued)**

| State | City | Company | Line speed[a] | Model[b] | Production[c] |
|---|---|---|---|---|---|
| **Kentucky** | Bowling Greene (new) | GM | 15 | Corvette | 22,838 |
| TOTAL, United States | | | 2,381[n] | | 5,100,326[v] |
| | | | **CANADA** | | |
| **Ontario** | Oshawa | GM | 100 | Chevrolet, Pontiac, Celebrity, 6000 | 247,274 |
| | Oakville | Ford | 60 | LTD | 129,037 |
| | St. Thomas | Ford | 58 | EXP, LN7 | 134,225 |
| | Windsor[r] | Chrysler | | Cordoba, Mirada, Imperial, Gran Fury, Diplomat, Caravelle, New Yorker | 149,442 |
| | Brampton | AMC | 60 | Concord, Eagle, Spirit | 30,340 |
| Province Total | | | 278 | | 690,318 |
| **Quebec** | Ste. Therese | GM | 45 | Cutlass | 86,374 |
| **Nova Scotia** | Halifax | Volvo | 6 | DL, GL, GLT | 10,118 |
| TOTAL, Canada | | | 329 | | 786,810 |

SOURCE: The various companies.
a. Nominal line speed in cars per hour. This can vary depending on model mix and market requirements.
b. 1983 model year.
c. 1982 model year.
d. Author's estimates.
e. Caravelle is sold in Canada.
f. Beginning 1984 model year, rear-drive Cadillacs and Oldsmobiles will be sourced here.
g. Beginning 1985 model year, Cadillac Eldorado and Seville, Oldsmobile Toronado, and Buick Riviera will be sourced here. The plant is still under construction.
h. "Buick City" will be rated at 75.
i. Checker ceased production of vehicles in July 1982.
j. Beginning 1984 model year, large front-drive Cadillacs and the Oldsmobile 98 will be sourced here.
k. Beginning 1984 model year, N-body cars of Oldsmobile, Buick, and Pontiac will be sourced here.
l. During the 1982 model year, Pontiac Bonneville and Grand Prix were sourced here. During the 1984 model year the P car will be sourced here.
m. Large K cars will be produced beginning 1983.
n. Estimated 1986 model year capacity.
p. Ford plans to shift car production to Ontario in 1985 in order to produce its minivan in St. Louis. Chrysler is activating an idle truck plant to resume production of its rear-drive cars, formerly assembled in Windsor, new home of the T115 van.
q. Plant to begin producing Buick Electras and Oldsmobile 98s in fall 1983.
r. This plant is temporarily inactive.
s. This plant is permanently closed.
t. Joint GM-Toyota venture.
u. This plant will close permanently in May 1983.
v. Includes ElCamino and Caballero, classified as trucks in MVMA tabulations.
w. Plant is being converted to truck production.

of 4 million vehicles (the 1978 figure) does not pale the imagination. As a practical matter, this state's capacity is probably going to be 5 million units annually.

By way of historical precedent, it is instructive to compare 1982–86 with two similar periods. In 1931, Michigan factories produced 715,000 vehicles, a third of the U.S. total of 2,167,000 for that year and less than half the 1929 figure for this state. The 1929 national figure was 4,780,000. In 1935, about 1,735,000 vehicles were assembled here out of a U.S. total of 3,718,000. During the Great Depression, capacity had been trimmed outside of the industrial heartland.

In 1961, fewer than 2 million cars, trucks, and buses rolled from Michigan assembly lines, about two-thirds the figure of the previous peak (1955) and 29 percent of the U.S. total. In 1965, 3,750,000 vehicles were Michigan made, 34 percent of the U.S. figure for that year and nearly double this state's 1961 level of production. The story of this state's long domination of the U.S. vehicle industry and of its ups and downs is encapsulated in the numbers in Table 2.

**TABLE 2**
**Production of Motor Vehicles in Michigan and the United States, Selected Years: 1904–1982**

| Year | Cars | | | Trucks and Buses | | |
|---|---|---|---|---|---|---|
| | Michigan | United States | Percentage | Michigan | United States | Percentage |
| | | | (In thousands) | | | |
| 1904 | 9 | 20 | 45 | .1 | 1 | 7 |
| 1909 | 64 | 122 | 52 | 1 | 5 | 19 |
| 1914 | 437 | 544 | 80 | 6 | 25 | 24 |
| 1919 | 591 | 1,684 | 35 | 49 | 126 | 39 |
| 1921 | 441 | 1,406 | 31 | 32 | 106 | 31 |
| 1923 | 1,008 | 3,432 | 29 | 67 | 281 | 24 |
| 1925 | 1,280 | 3,581 | 36 | 126 | 342 | 37 |
| 1927 | 1,460 | 2,826 | 52 | 91 | 330 | 28 |
| 1929 | 1,595 | 4,388 | 36 | 82 | 392 | 21 |
| 1931 | 675 | 1,921 | 35 | 40 | 246 | 16 |
| 1935 | 1,587 | 3,213 | 49 | 148 | 505 | 29 |
| 1953 | 2,196 | 6,135 | 36 | n.a. | n.a. | n.a. |
| 1954 | 1,768 | 5,509 | 32 | n.a. | n.a. | n.a. |
| 1955 | 2,708 | 7,950 | 34 | n.a. | 1,254 | n.a. |
| 1956 | 1,917 | 5,808 | 33 | n.a. | 1,012 | n.a. |
| 1957 | 2,118 | 6,120 | 35 | 180 | 1,100 | 16 |
| 1958 | 1,239 | 4,247 | 29 | 153 | 873 | 18 |
| 1959 | 1,658 | 5,599 | 30 | 184 | 1,124 | 16 |
| 1960 | 2,092 | 6,703 | 31 | 203 | 1,202 | 17 |
| 1961 | 1,774 | 5,522 | 32 | 171 | 1,130 | 15 |
| 1962 | 2,280 | 6,943 | 33 | 228 | 1,254 | 18 |
| 1963 | 2,590 | 7,644 | 34 | 265 | 1,464 | 18 |
| 1964 | 2,622 | 7,745 | 34 | 385 | 1,562 | 25 |
| 1965 | 3,255 | 9,335 | 35 | 495 | 1,802 | 27 |
| 1966 | 3,024 | 8,605 | 35 | 515 | 1,792 | 29 |
| 1967 | 2,600 | 7,413 | 35 | 459 | 1,611 | 28 |
| 1968 | 3,009 | 8,849 | 34 | 511 | 1,972 | 26 |
| 1969 | 2,873 | 8,224 | 35 | 533 | 1,982 | 27 |
| 1970 | 2,099 | 6,550 | 32 | 454 | 1,734 | 26 |
| 1971 | 2,836 | 8,584 | 33 | 587 | 2,088 | 28 |
| 1972 | 2,902 | 8,828 | 33 | 734 | 2,483 | 30 |
| 1973 | 3,268 | 9,667 | 34 | 1,012 | 3,015 | 34 |
| 1974 | 2,403 | 7,325 | 33 | 897 | 2,747 | 33 |
| 1975 | 2,249 | 6,717 | 33 | 757 | 2,270 | 33 |
| 1976 | 2,914 | 8,498 | 34 | 1,030 | 3,000 | 34 |
| 1977 | 2,852 | 9,214 | 31 | 1,077 | 3,489 | 31 |
| 1978 | 2,706 | 9,177 | 29 | 1,288 | 3,723 | 35 |
| 1979 | 2,582 | 8,434 | 31 | 996 | 3,046 | 33 |
| 1980 | 1,732 | 6,376 | 27 | 443 | 1,634 | 27 |
| 1981 | 2,040 | 6,253 | 33 | 460 | 1,690 | 27 |
| 1982 | 1,818 | 5,073 | 36 | 577 | 1,913 | 30 |

SOURCE: Bureau of the Census, **Manufacturers 1905** (Washington, D.C.: Government Printing Office, 1908), Part IV, p. 272, and similar documents for years 1909-1935; **Automotive News**, Almanac Issue, 1954 through 1972; Ward's Communications, Inc., **Wards Automotive Yearbook**, 1958 through 1972 (Detroit: annually); Motor Vehicle Manufacturers Association, special release; and the various companies, 1972-1982 Michigan figures.
n.a.: not available.

## THE 1978–82 DEBACLE

Anyone who has not worked with industry statistics published by the federal government and other organizations is probably a stranger to the Standard Industrial Classification (SIC) employed for classifying business establishments. The SIC is a system for classifying business establishments according to their major activity and product. A Census of Manufacturers pertains only to establishments whose major activity is manufacturing; although some establishments may engage in minor activities such as wholesaling, they are classified as manufacturers as long as manufacturing is their major activity. Within this sector, establishments are further categorized into particular industries on the basis of their major product. Each establishment falls into one and only one industry even though it may manufacture several products. Every industry is assigned a four-digit code number. When data are collected from manufacturing establishments, they are grouped for publication according to these SIC code numbers.

The next level of aggregation is the three-digit SIC, formed by combining related four-digit industries. SIC 371, for example, known as Motor Vehicles and Motor Vehicle Equipment, is comprised of SIC 3711 (Motor Vehicles and Passenger Car Bodies), SIC 3713 (Truck and Bus Bodies), SIC 3714 (Motor Vehicle Parts and Accessories), and SIC 3715 (Truck Trailers). At the last employment peak for Michigan, there were about 400,000 white- and blue-collar workers (wage and salary employed) in SIC 371, or 40 percent of the 1,000,000 U.S. workers so employed.

In 1981, Michigan State University's now defunct Bureau of Business and Economic Research surveyed supplier firms in an eight-county southeast Michigan region (Lapeer, Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne counties). Except for GM, Ford, and Chrysler, all establishments with one hundred or more employees and one in ten of those with fewer employees were queried regarding their automobile activity. Of 1,769 establishments for which useable responses were received, 1,366 were directly linked to the automotive industry as suppliers.

The extent of Michigan's vast automotive infrastructure also was demonstrated in a 1981 survey by the Michigan Employment Security Commission. The MESC queried manufacturing establishments with one hundred or more employees regarding their automotive supplier activity. The results are shown in Table 3.

On the basis of the MSU and MESC studies it is estimated that there were 750,000 automotive-related man-

## TABLE 3

### Employment in All Motor-Vehicle-Related Manufacturing Industries in Michigan: March 1979 and March 1980

| SIC code | Industry title | Percent motor-vehicle-related | Total employment March 1979 | March 1980 |
|---|---|---|---|---|
| 2271 | Woven Carpets & Rugs | 100.0 | * | * |
| 2295 | Coated Fabrics, Not Rubberized | 100.0 | * | * |
| 2396 | Automotive Trimmings | 99.9 | 18,025 | 12,750 |
| 2399 | Fabricated Textile Products, n.e.c. | 93.7 | * | * |
| 2531 | Public Building & Related Furniture | 29.7 | 2,650 | 3,125 |
| 2851 | Paints, Varnishes, & Allied Products | 63.9 | 3,675 | 3,200 |
| 3011 | Tires & Inner Tubes | 100.0 | * | * |
| 3041 | Rubber & Plastic Hose & Belting | 78.2 | 850 | 250 |
| 3079 | Misc. Plastic Products | 66.7 | 27,500 | 25,900 |
| 3211 | Flat Glass | 92.3 | * | * |
| 3231 | Glass Products | 42.9 | 4,175 | 3,900 |
| 3296 | Gaskets, Packing & Sealing Devices | 60.0 | 1,600 | 1,350 |
| 3312 | Blast Furnaces, Steel Works, & Rolling Mills | 91.2 | 24,300 | 21,400 |
| 3321 | Gray Iron Foundries | 87.3 | 27,725 | 19,500 |
| 3322 | Malleable Iron Foundries | 94.0 | 6,150 | 4,325 |
| 3325 | Steel Foundries, n.e.c. | 28.8 | 1,850 | 1,850 |
| 3357 | Drawing & Insulating of Nonferrous Wire | 46.9 | 1,400 | 1,875 |
| 3361 | Aluminum Foundries | 45.4 | 4,400 | 3,900 |
| 3429 | Hardware, n.e.c. | 69.9 | 16,400 | 14,475 |
| 3451 | Screw Machine Products | 48.3 | 6,750 | 6,075 |
| 3452 | Bolts, Nuts, Screws, Rivets, & Washers | 83.2 | 4,550 | 4,225 |
| 3462 | Iron & Steel Forgings | 65.7 | 6,025 | 4,775 |
| 3465 | Automotive Stampings | 100.0 | 58,800 | 45,225 |
| 3493 | Steel Springs, Except Wire | 76.9 | 1,950 | 1,300 |
| 3519 | Internal Combustion Engines | 86.2 | * | * |
| 3555 | Special Tools & Dies | 72.6 | 27,450 | 26,275 |
| 3592 | Carburetors, Pistons, Piston Rings, & Valves | 74.4 | 6,450 | 5,575 |
| 3651 | Radio & Television Receiving Sets | 16.0 | 1,400 | 1,175 |
| 3691 | Storage Batteries | 100.0 | * | * |
| 3694 | Elec. Equip. for Internal Combustion Engines | 86.1 | 12,825 | 9,200 |
| 3711 | Motor Vehicles & Passenger Car Bodies | 100.0 | 238,400 | 209,750 |
| 3713 | Truck & Bus Bodies | 100.0 | 1,225 | 1,875 |
| 3714 | Motor Vehicle Parts & Accessories | 100.0 | 173,575 | 135,325 |
| 3715 | Truck Trailers | 100.0 | * | * |
|  | TOTAL |  | 707,475 | 592,925 |

SOURCE: Michigan Employment Security Commission; Bureau of Research and Statistics, **Motor Vehicle and Related Industries in Michigan**, Summer 1981.
*Included in totals to avoid disclosure.
n.e.c. — not elsewhere classified.

ufacturing jobs in Michigan during the last quarter of 1978. This represented 19 percent of the state's total employment and did not include advertising, banking, insurance, trucking, railroads, and other nonmanufacturing jobs entailed in the provision of services to the auto industry. By the last quarter of 1982, the number of automotive-related manufacturing jobs in Michigan stood at about 525,000, a decline of 30 percent from the 1978 peak.

## EMPLOYMENT PROSPECTS

Whereas ten years ago it meant better lighting at work stations and new paint on factory walls, these days quality of work life (QWL) is meaningful employee participation and involvement in decisions affecting their jobs. Management listens to and acts on the advice of its work force, who are intimately acquainted with the work flow. There is less emphasis on the urgency of keeping the production line going at all costs and more focus on the process itself and on human dignity. At upper echelons, management and labor have expressed their determination to build relationships based on trust, confidence, honesty, and openness. Reduced stress in the workplace is one outcome; high level, high quality production is another.

Participatory management starts with the blurring of class distinctions. There is one parking lot and one cafeteria to serve both hourly and salaried workers. Few salaried workers wear suits and neckties in today's QWL factory. In plants where it has been introduced, participatory management entails sharing of cost data and various other information once kept secret. Teamwork replaces lines of authority. Insofar as possible, the men and women at the machines decide who will do what. Foremen become coordinators and facilitators. Workers decide when the production process should be interrupted to make corrections; they are encouraged to consult directly with maintenance people, each other, or management to remedy defects before they become serious, as well as to improve products and processes. Job definitions are imprecise.

Labor projections also are affected by vehicle downsizing. In 1981, the University of Michigan, the Michigan Manufacturers Association, and Arthur Andersen and Co., with the participation of the Transportation Systems Center of the U.S. Department of Transportation, surveyed industry experts on the projected use of materials, with the following results:

| Material (pounds per U.S. produced passenger car) | Actual 1980 | Projected 1985 | 1990 |
|---|---|---|---|
| Steel (low-carbon and HSLA) | 1,900 | 1,600 | 1,300 |
| Iron | 500 | 300 | 250 |
| Plastics (nonreinforced, fiber-reinforced, and metal laminate) | 200 | 240 | 300 |
| Aluminum (cast and wrought) | 120 | 150 | 200 |
| Glass | 90 | 70 | 50 |
| Other | 490 | 340 | 150 |
| Total | 3,300 | 2,700 | 2,250 |

SOURCE: The University of Michigan and Arthur Andersen and Company, **U.S. Automotive Industry in the 1980s: A Domestic and Worldwide Perspective** (Detroit: 1981), p. 17.

Michigan's foundry, steel, forgings, and stampings industries already have been heavily affected by the sharp decline in automotive production and by downsizing. There is no likelihood of their returning to 1978 volumes of production even if unit production of vehicles returns to that level. Smaller engines are shrinking the market for piston rings, bearings, and other machine parts, made in Michigan as well as other places.

Increasingly, robots are replacing human beings to do repetitive, dangerous, and undesirable jobs. According to a recent study by The W. E. Upjohn Institute for Employment Research, robotics will displace 30 to 40 percent of Michigan's production painter jobs in the automotive industry.[1] Among welders here, the job loss would lie in the 15–20 percent range. Total displacement from the blue-collar work force due to robotics would range between 5.1 percent and 8.6 percent, or between 10,000 and 18,000 of the 207,000 blue-collar workers employed in Michigan by GM, Ford, and Chrysler in 1978.

Robotics, participatory management, and process designs are revolutionizing the production process. Buick City, for example, will operate with nearly five thousand wage and salaried people as compared with about seven thousand now in the Buick and Fisher Body plants. In short, to survive as the automotive capital, Detroit must be far less extravagant with labor, materials, and working capital than it was in 1978. Fewer blue-collar jobs require fewer white-collar supporting jobs. Participatory management reduces the salaried-to-hourly worker ratio in the plants. The new management ethic of facile communications between top echelons and the plant floor requires fewer layers or levels of management. Finally, a subject not touched on so far, office automation is expected to thin the white-collar ranks.

Just-in-time production is expected to create new jobs. Recently the City of Detroit acquired idled, antiquated Chrysler facilities on its east side. The site will be prepared for an industrial park designed to attract suppliers not just to GM but to nearby Chrysler and Ford plants. Suppliers also are expected to locate in a new industrial park in Hamtramck and in similar parks and vacant factories throughout southern Michigan.

The automotive Big Three employed 500,000 people in this state in late 1978 and early 1979. As a result of downsizing products and streamlining operations, they are expected to employ 350,000 at the next peak (fall 1985) and to achieve unit production at the ten million unit level. These figures represent total employment, including nonmanufacturing and nonautomotive operations such as Ford's farm tractor plant in Romeo. Automotive manufacturing employment will decline from about 425,000 to 300,000. Suppliers employed around 325,000 in 1978. The streamlined industry, including new facilities to meet the just-in-time regimen, is expected to employ 300,000.

Given the U.S. Department of Commerce vehicle market analysis, there will be no more than 600,000 Michigan jobs entailed in the manufacture of vehicles and components in fall 1985. That figure represents a permanent loss of 150,000 such jobs from the 1978 peak.

It is instructive to review the 1961–65 experience from a productivity perspective. In 1961 the industry produced 10.5 vehicles per worker, not allowing for supplier industries to SIC 371. By 1965, the industry was making 13.2 vehicles per worker. In 1978, unit output per worker was actually marginally below the 1965 figure, and in 1982 it was below the 1961 figure. True, the 1961 vehicle was much less sophisticated than its 1981 counterpart, but it also was considerably more affordable by the typical U.S. household.

To find markets for ten million cars, trucks, and buses made in the United States, the industry very likely will have to exceed the 1978 level of unit output per worker. It is my guess that workers in SIC 371 will have to produce 15 units each on the average and of a higher quality than the 1978 or 1982 products. That implies 667,000 blue- and white-collar workers in SIC 371, of which about 45 percent or 300,000 would be in Michigan factories, offices, and so forth. If the industry can substantially improve its productivity to 17 units per worker, then the 1978 level of production seems attainable, implying about 750,000 jobs nationwide in SIC 371, of which 325,000 or 43 percent would be in Michigan factories. Total manufacturing employment entailed in vehicle production would approximate 650,000, still 100,000 or 13 percent short of the 1978 level.

A dramatic turnaround in productivity would justify the relatively high level of wages in the industry. For 1982, average hourly earnings for blue-collar workers in SIC 371 were $11.12. This was 45 percent above average hourly earnings for production workers in all private industry in this country. Data on average earnings for management are not readily available. However, they would reveal a greater percentage differential over SIC 371 and the rest of the private sector.

## THE SHAPE OF 1986

At the low-wage, low-skill level, many Michigan jobs already have disappeared. They were lost with the closure of wiring harness plants in Atlanta, Standish, Sault Ste. Marie, Morley, and Clare. Those plants primarily employed women who were paid wages somewhat above the minimum to assemble electric wiring systems for motor vehicles. Closings also include muffler factories, small foundries and stampings plants, plastic extrusion plants, and various other components factories. These terminations resulted from the depressed market as well as the lure of Mexican labor at 85 cents per hour.

By the mid-1980s automotive electronics will be more popular. In luxury cars on-board computers will adjust seats and mirrors to suit the driver, issue warnings to intoxicated or drowsy drivers, and monitor trips in addition to controlling engine speed, warning of malfunction, and so forth. With a high proportion of luxury car production located here, Michigan can expect to attract foreign companies interested in increasing their shares of the Canadian and U.S. markets for automotive electronics. The industrial parks in southeast Michigan may also host plants that produce high value-added components for those luxury cars, styled and engineered to European standards. Turbo chargers, for example, will be required on engines made in Lansing, Flint, Pontiac, Livonia, Dearborn, and Detroit.

Detroit's suppliers will seek diversity in their markets. A link-up of office and automotive electronics is one logi-

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cal outcome. Grand Rapids, after all, is the office furniture capital of the world.

Engines from Japan find their way into cars assembled in this country. Connecting rods from a factory in Dearborn are sent to an engine factory in Wales. The trend to global sourcing of components can be expected to continue, even though it contradicts the principle of just-in-time. What economists call economies of scale are partly responsible for this phenomenon. Today's engine factories, for example, are designed for optimum production of 500,000 or more automotive power plants annually. Rarely does a single vehicle assembly plant operate at that scale. Cost and risk-sharing are other reasons for global sourcing. Chrysler Corporation installs gasoline engines from its partner Mitsubishi because it cannot afford to build a separate plant. Ford will import diesel engines for its new Tempo and Topaz cars from its partner Toyo Kogyo for the same reasons. In short, the Michigan product of 1986 will incorporate a higher proportion of components made in Canada, Japan, Spain, Mexico, Germany, and other countries. In turn, factories here will export hydramatic transmissions, steering gear, engines, and other components in greater dollar volume than now.

Traditionally, virtually all of Ford's automotive research and development activity has taken place in Michigan. Ford's R & D efforts were augmented last year with the new Paint Research Center in Mount Clemens and the new Robotics and Automation Applications Consulting Center in Dearborn. Chrysler is consolidating its introl Division (instruments and electronics) in Huntsville, Alabama. Its major R & D activity is near headquarters in Highland Park, Michigan. Recently Chrysler converted its Eight Mile (Detroit) Stamping Plant to a manufacturing technology center. Warren, Michigan, is home of the GM Technology Center. GM also maintains considerable R & D activity at its divisional headquarters in Lansing (Oldsmobile), Flint (Buick, AC Spark Plug), Pontiac (Pontiac Motor, GM Truck and Bus Group), Detroit (Cadillac, Detroit Diesel Allison), Ypsilanti (Hydramatic), and Saginaw (Saginaw Steering Gear, Central Foundry). Suppliers such as Bendix, Budd, Eaton, and Sealed Power also conduct automotive R & D in the Wolverine State.

These activities are reflected in patent statistics. Of the ten companies which were granted twenty or more patents with a Michigan origin in 1980, five were in the automotive business.

| Company | Number of patents | |
|---|---|---|
| | Michigan | United States |
| General Motors | 188 | 326 |
| Upjohn | 148 | 170 |
| Dow | 144 | 259 |
| Ford Motor | 133 | 145 |
| BASF | 47 | 56 |
| Bendix | 43 | 131 |
| Eaton | 42 | 104 |
| Dow Corning | 26 | 31 |
| Chrysler | 23 | 25 |
| Ethyl | 23 | 50 |

These companies accounted for 429 or 20 percent of the 2,167 patents granted in Michigan that year; they accounted for 59 percent of the patents granted to the companies. The underlying patent data show that 25–30 percent of the patents granted in Michigan are related to motor vehicles, 20–25 percent to pharmaceuticals and other chemicals, and 15–20 percent to machinery, including materials handling equipment. Historically, 13–14 percent of all privately funded R & D spending in the nation has taken place in Michigan. With the need to keep abreast of new automotive and production technology, that share will increase by middecade. However, because of the rapid productivity gains made possible by computers, the ranks of engineers and scientists will thin in companies already here, providing a source of skilled labor for newcomers.

In summary, Michigan's automotive industry will be more fully integrated into the global automotive industry, more technology oriented, and less labor intensive at all skill levels than it was in 1978. Displaced skilled workers, white- and blue-collar, will find employment with companies that expand or relocate here, or they will leave for jobs in other states. Displaced unskilled workers will find the transition more difficult, especially those that are over fifty, male, and black.

### NOTES

1. H. Allan Hunt and Timothy L. Hunt, *Robotics, Human Resource Implications for Michigan, A Summary* (Kalamazoo: The W. E. Upjohn Institute for Employment Research, 1982), p. 6.

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# OUTLOOK FOR THE OUTSTATE SMSAs

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It is now evident that the 1981–82 national recession has run its course, with the end point occurring in December of 1982. According to the scenario put forth in this article, the ensuing recovery in 1983 will be led by consumer demand and will be relatively mild by historical standards in the initial stages, with much stronger growth expected by the second half of 1983. Of critical interest to the residents of Michigan is how such a scenario of the national economy would translate into local economic prospects, particularly in terms of labor markets.

The focus of this article is the outlook over the next two years for the labor markets in the eleven Standard Metropolitan Statistical Areas outside of the Detroit area (collectively referred to as the "outstate SMSAs"). Approximately one-half of the workers in Michigan are employed outside of greater Detroit, with three-quarters of those employed in metropolitan areas ranging in size from Grand Rapids to Bay City. This "urban belt," stretching across the southern Lower Peninsula, is dominated on the east by automotive production but is more diversified on its western side. (A breakdown of SMSAs by county can be found in Table 1.)

**TABLE 1: Outstate SMSAs of Michigan**

| SMSA | Counties |
|---|---|
| Southeast | |
| Ann Arbor-Ypsilanti | Washtenaw |
| Bay City | Bay |
| Flint | Genesee, Shiawassee |
| Jackson | Jackson |
| Lansing-East Lansing | Clinton, Eaton, Ingham, Ionia |
| Saginaw | Saginaw |
| Southwest | |
| Battle Creek | Barry, Calhoun |
| Benton Harbor | Berrien |
| Grand Rapids | Kent, Ottawa |
| Kalamazoo-Portage | Kalamazoo, Van Buren |
| Muskegon-Norton Shores-Muskegon Heights | Muskegon, Oceana |

Further information on the forecasts, the forecasting system, and the economic characteristics of Michigan, Detroit, and the outstate SMSAs is provided in the following publication:

**A Regional Econometric Forecasting System:**
**Major Economic Areas of Michigan**
by Harold T. Shapiro and George A. Fulton
Available Fall 1983 from the University of Michigan Press, Ann Arbor, MI 48109.

A system of regional econometric models has been designed and implemented in conjunction with a computer simulation program at the Institute of Labor and Industrial Relations (ILIR), University of Michigan, in order to generate forecasts of employment and unemployment activity for each of the major urban areas in Michigan. A set of two-year forecasts was produced in May 1983, and the results for the outstate SMSAs are summarized in the following sections.

## NATIONAL OUTLOOK

The local outlook is conditional on the expected course of events in the national economy. The projected paths of certain national economic indicators that serve as key inputs to the local models were provided by the Research Seminar in Quantitative Economics (RSQE), University of Michigan. These national inputs to the outstate SMSA forecasts for 1983 and 1984 are summarized in Table 2.[1] The inputs were supplemented where necessary with forecasts from an auxiliary national model developed at ILIR.

The RSQE forecast (dated May 1983) portrays a recovery in 1983 and 1984 from a prolonged and costly recession that began in mid-1981. This recovery is characterized by a consumer-led increase in final demand, resulting from increased levels of purchasing power, lower interest rates, and improved liquidity accompanying reduced levels of consumer debt.

On a calendar-year basis, the inflation-adjusted Gross National Product (real GNP) is expected to grow by 3.4 percent from 1982 to 1983 and by 6.1 percent from 1983 to 1984. As a consequence, the recovery phase is anticipated to proceed more slowly than those following the last two prominent downturns (1975–76 and 1958–59) when growth rates for real output in the initial year of recovery were in the range of 5.5 percent to 6.0 percent. The rate of real GNP growth is expected to accelerate rapidly in the second half of 1983 and early 1984 as the recovery diffuses to other sectors of the economy and business capital spending turns up. Although the economy is forecast to expand throughout 1984, the pace of recovery slackens over the year.

The housing and automotive sectors are important components of the predicted expansion, responding to the expected increase in consumer purchasing power and lower interest rates. Housing starts are projected to increase from an average annual rate of 1.2 million units in the second half of 1982 to a rate of 2.0 million units in 1984. Automobile sales are forecast to increase from an average annual rate of 8.2 million units to 10.3 million units between the last half of 1982 and the end of 1984. Further detail on this national economic scenario is provided in Table 2.

## LOCAL OUTLOOK

Economic forecasting on a local level is a challenging endeavor, complicated by the problems of limited data availability and sensitivity of the economic profiles to actions of individual firms. ILIR is attempting to provide additional information on the prospects for the local economies in Michigan by implementing a regional econometric forecasting system. The labor market outlook for the outstate SMSAs in 1983 and 1984, as suggested by this forecasting system in conjunction with the national economic scenario, is summarized in the remaining tables in this article.

The employment situation in the "urban" regions of Michigan is forecast to improve considerably over the 1983–84 period. Details of these projected improvements are presented in Tables 3 and 4, which also show the severe decline in employment experienced between 1979 and 1982 when an average of one in every eleven jobs was lost in the outstate SMSAs. The average rates of job loss per year over the last three years and the projections of average annual job growth over the next two years are reported for each outstate SMSA in Table 3. The statistics used for 1979 and 1982 in the computations are estimates provided by the Michigan Employment Security Commission and are based on the 1982 benchmark. The rank order of the 1982–84 growth rates over the eleven SMSAs is shown in the last column. For comparative purposes, the SMSAs are listed in the table in descending order of their concentration in motor vehicle employment.

The outstate "urban" region as a whole is forecast to realize an average per year growth in jobs of 3.2 percent from 1982 to 1984, a substantial improvement over an average loss of jobs of 3.0 percent per year from 1979 to 1982. Traditionally, consumer led recoveries have promoted stronger growth in the automobile based economies situated in the southeastern section of the state

**TABLE 2. National Input Variables to the Outstate SMSA Forecasts**

| Input variables | Calendar year | | | 1982 (Actual) | 1983 | | 1984 | |
|---|---|---|---|---|---|---|---|---|
| | 1982 (Actual) | 1983 | 1984 | July–Dec. | Jan.–June | July–Dec. | Jan.–June | July–Dec. |
| % change at annual rate* | | | | | | | | |
| Real GNP (% change) | −1.7 | 3.4 | 6.1 | 0.6 | 2.7 | 7.5 | 6.3 | 4.3 |
| GNP deflator (% change) | 6.0 | 4.6 | 4.3 | 4.6 | 4.9 | 4.0 | 4.2 | 4.7 |
| Industrial production, manufacturing (% change) | −8.5 | 6.0 | 13.1 | −4.1 | 5.4 | 17.9 | 13.6 | 7.6 |
| Level in period | | | | | | | | |
| Auto sales (millions) | 8.0 | 9.0 | 10.1 | 8.2 | 8.5 | 9.5 | 9.9 | 10.3 |
| Housing starts (millions) | 1.1 | 1.8 | 2.0 | 1.2 | 1.7 | 1.9 | 2.0 | 2.0 |
| Aaa corporate rate (%) | 13.8 | 11.3 | 10.7 | 12.8 | 11.6 | 11.1 | 10.8 | 10.7 |
| Unemployment rate (%) | 9.7 | 9.9 | 8.0 | 10.3 | 10.3 | 9.5 | 8.3 | 7.7 |

*Percentage changes in the first three columns are from the previous calendar year to the indicated calendar year. Percentage changes in the last five columns are from the previous half year to the indicated half year, scaled to annual rates.
SOURCE: Research Seminar in Quantitative Economics, The University of Michigan, May 1983.

**TABLE 3: Average Annual Growth Rates in Jobs for the Outstate SMSAs: 1979–82 and 1982–84**

| Region* | Average annual growth rates (%) 1979–82 (actual) | Average annual growth rates (%) 1982–84 (projected) | Rank order of projected 1982–84 growth rates |
|---|---|---|---|
| Flint | −5.1 | 4.8 | 1 |
| Saginaw | −5.3 | 3.6 | 4 |
| Lansing | −1.9 | 2.9 | 6 |
| Ann Arbor | −2.7 | 3.9 | 2 |
| Bay City | −3.3 | 3.1 | 5 |
| Jackson | −5.0 | 0.4 | 11 |
| Southeast | −3.7 | 3.5 | |
| Benton Harbor | −5.0 | 1.5 | 9 |
| Kalamazoo | −1.9 | 1.7 | 8 |
| Muskegon | −3.0 | 1.0 | 10 |
| Grand Rapids | −1.2 | 3.8 | 3 |
| Battle Creek | −3.4 | 2.2 | 7 |
| Southwest | −2.2 | 2.7 | |
| Total outstate | −3.0 | 3.2 | |

*The regions are listed in descending order of their concentration in motor vehicle employment.

and somewhat less growth in the southwest. The recovery predicted for 1983–84 follows this geographic pattern, with the average annual growth rate in jobs projected to be 3.5 percent in the southeast (excluding Detroit) and 2.7 percent in the southwest. However, with employment declines of 3.7 percent per year in the southeast and 2.2 percent per year in the southwest over the three-year period from 1979 to 1982, these regions are not expected to regain 1979 job levels by the end of 1984.

Employment recovery in the individual SMSAs from 1982 to 1984 is forecast to range from an average annual increase of approximately 5 percent in Flint to virtually no change in Jackson. Five of the six local economies in the southeast are projected to experience the highest rates of job growth among the eleven SMSAs. The remaining area in the southeast, Jackson, is predicted to be the lowest ranking SMSA, as it was in the period following the last recession (1975–77). Conversely, Grand Rapids, the most populated area in the southwest region of the state, is characterized as being one of the highest growth areas among the SMSAs. This diversified and relatively healthy local economy also realized one of the largest expansions among all SMSAs in the state during the last recovery period.

These growth patterns in employment over the 1979–84 period can also be translated into changes in job levels. For each SMSA the actual net job loss from 1979 to 1982, the projected net job recovery from 1982 to 1984, and the predicted net change in jobs between 1979 and 1984 are reported in Table 4. The outstate "urban" region as a whole is forecast to realize an increase of 75,600 jobs from the average levels experienced in 1982 to those predicted for 1984. This projected expansion, however, involves the recovery of only two out of every three jobs lost between 1979 and 1982, leaving the area economies with 37,900 fewer jobs in 1984 than existed in 1979.

Most of this shortfall from 1979 employment levels (29,900 out of the 37,900 jobs) is expected to occur in the southeast region. Although this region is forecast to regain more jobs over the next two years than the southwest (46,400 jobs versus 29,200 jobs), over twice as many jobs were lost in the southeast from 1979 to 1982. The only SMSAs forecast to realize net job gains on a calendar-year basis between 1979 and 1984 are Grand Rapids (10,300) and Lansing (200). The remaining areas are anticipated to regain jobs lost in the recession at rates that vary from one job in twenty in Jackson and one job in five in Benton Harbor and Muskegon to 93 percent of the jobs lost in Ann Arbor. Complete details are provided in Table 4.

**TABLE 4: Net Changes in Job Levels for the Outstate SMSAs: 1979–84**

| Region* | 1979–82 Net job loss (actual) | 1982–84 Net job recovery (projected) Jobs | 1982–84 Net job recovery (projected) % Recovery from 1979 | 1979–84 Net job change (projected) |
|---|---|---|---|---|
| Flint | −29,400 | 16,900 | 57 | −12,500 |
| Saginaw | −13,600 | 5,700 | 42 | −7,900 |
| Lansing | −10,700 | 10,900 | 102 | 200 |
| Ann Arbor | −11,300 | 10,500 | 93 | −800 |
| Bay City | −3,400 | 2,000 | 59 | −1,400 |
| Jackson | −7,900 | 400 | 5 | −7,500 |
| Southeast | −76,300 | 46,400 | 61 | −29,900 |
| Benton Harbor | −9,200 | 1,700 | 18 | −7,500 |
| Kalamazoo | −6,100 | 3,700 | 61 | −2,400 |
| Muskegon | −5,500 | 1,100 | 20 | −4,400 |
| Grand Rapids | −9,800 | 20,100 | 205 | 10,300 |
| Battle Creek | −6,600 | 2,600 | 39 | −4,000 |
| Southwest | −37,200 | 29,200 | 78 | −8,000 |
| Total outstate | −113,500 | 75,600 | 67 | −37,900 |

*The regions are listed in descending order of their concentration in motor vehicle employment.

## DYNAMIC PATH OF THE LOCAL OUTLOOK

One difficulty with summarizing the outlook using information based on calendar-year averages is that the underlying dynamic paths are masked. Since the forecasting system developed at ILIR generates quarterly information, more details can be provided on the patterns of the projected employment paths. The quarterly employment statistics were seasonally adjusted by the authors by means of the Census X-11Q Program and then were averaged for each half of the calendar year (that is, January through June and July through December of each year). The results from 1982 to 1984 for each outstate SMSA are presented in Table 5. The corresponding percentage changes are also provided and are stated in terms of annual rates for ease of comparison with other statistics in this article.

The statistics for the outstate SMSAs in total indicate that the decline in jobs decelerates in the second half of 1982, followed by a modest increase predicted for the first half of 1983. By the second half of 1983 substantial job recovery is under way, averaging a 5 percent seasonally adjusted annual rate across the areas. This rate of recovery accelerates to 5.5 percent in the first half of 1984 and to 5.8 percent in the second half of the year.

This recovery is led by the manufacturing sector, as might be expected from the national outlook and the

**THE MICHIGAN ECONOMY**

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# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 39.9 | 41.4 | 41.6 (Mar.) |
| Average weekly hours, U.S. | 39.1 | 38.8 | 39.6 (Mar.) |
| Average hourly earnings, Michigan ($) | 11.11 | 11.40 | 11.39 (Mar.) |
| Average hourly earnings, U.S. ($) | 8.37 | 8.74 | 8.75 (Mar.) |
| U.S. motor vehicle production (units) | 662,670 | 659,980 | 796,232 (Mar.) |
| Michigan electricity usage (mil. kwh.): | | | |
| Industrial (mil. kwh.) | 2,313 | 2,039 | 2,031 (Dec.) |
| Residential (mil. kwh.) | 1,978 | 1,635 | 1,956 (Dec.) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 827 | 561 | 675 (Mar.) |
| United States (000 net tons) | 11,744 | 5,676 | 7,127 (Mar.) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 278.2 | 292.3 | 292.4 (Mar.) |
| United States | 283.1 | 293.2 | 293.4 (Mar.) |
| U.S. producer price index (1967 = 100) | 298.0 | 301.2 | 300.5 (Mar.) |
| Michigan farm prices received index (1977 = 100) | 137 | 119 | 119 (Mar.) |

SOURCE: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administraton.

# Contracts for Future Building, First 3 Months: 1982 and 1983

(Thousands of Dollars)

| Area | Nonresidential | | | Residential | | | Total[a] | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1982 | 1983 | Percentage change | 1982 | 1983 | Percentage change | 1982 | 1983 | Percentage change |
| Ann Arbor | 24,229 | 12,556 | − 48 | 2,019 | 4,788 | + 137 | 16,248 | 17,344 | − 34 |
| Battle Creek | 9,882 | 2,160 | − 78 | 1,778 | 1,904 | + 7 | 11,660 | 4,064 | − 65 |
| Bay City | 400 | 292 | − 27 | 723 | 2,096 | + 190 | 1,123 | 2,388 | + 113 |
| Detroit | 98,732 | 90,326 | − 9 | 35,474 | 88,472 | + 149 | 134,206 | 178,798 | + 33 |
| Flint | 6,005 | 6,014 | — | 5,723 | 3,533 | − 38 | 11,728 | 9,547 | − 19 |
| Grand Rapids | 15,142 | 14,343 | − 5 | 10,984 | 25,682 | + 134 | 26,126 | 40,025 | + 53 |
| Jackson | 2,832 | 1,782 | − 37 | 965 | 4,102 | + 325 | 3,797 | 5,884 | + 55 |
| Kalamazoo-Portage | 101,864 | 3,055 | − 97 | 5,987 | 5,451 | − 9 | 107,851 | 8,506 | − 92 |
| Lansing-East Lansing | 4,335 | 13,399 | + 209 | 4,349 | 11,681 | + 169 | 8,684 | 25,080 | + 189 |
| Muskegon-Norton Shores-Muskegon Heights | 98 | 1,950 | +4,349 | 1,207 | 5,083 | + 321 | 1,305 | 7,033 | + 439 |
| Saginaw | 1,310 | 2,316 | + 77 | 1,350 | 2,112 | + 56 | 2,660 | 4,428 | + 66 |
| Toledo | 30,297 | 29,797 | − 2 | 8,518 | 18,941 | + 122 | 38,815 | 48,738 | + 26 |
| Michigan | 277,792 | 177,664 | − 36 | 96,355 | 206,380 | + 114 | 374,147 | 384,044 | + 3 |

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

Note: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing-East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; Muskegon-Norton Shores-Muskegon Heights includes Muskegon and Oceana counties; and Toledo includes Monroe County, Michigan, and Fulton, Lucas, Ottawa, and Wood counties, Ohio.

[a] Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1982 and 1983 figures for nonbuilding construction contracts were $111,556,000 and $99,946,000 respectively, or a decrease of 10 percent.

historical patterns of recovery in Michigan. Automotive activity is the main source of improvement in the manufacturing sector, as implied by the differentials in the rates of recovery between the southeast and southwest regions.

In terms of the individual SMSAs, there is a mixed performance forecast for the first half of 1983, with five of the areas realizing an expansion in jobs and the remaining six areas experiencing a continuation of the declines. Every SMSA in the state is expected to realize sustained positive growth from the second half of 1983 through the second half of 1984, but at widely varying rates. Most of the areas achieve their highest rates of growth over the forecast horizon in the second half of 1984. Additional details on the specific employment paths projected for each SMSA are given in Table 5.

**TABLE 5: Forecast of Total Jobs in Outstate SMSAs: Half-Year Averages, Seasonally Adjusted, 1982–84 (Percentage changes at annual rates)**

| Region | 1982 (actual) Jan.–June | 1982 (actual) July–Dec. | 1983 Jan.–June | 1983 July–Dec. | 1984 Jan.–June | 1984 July–Dec. |
|---|---|---|---|---|---|---|
| Ann Arbor | 131,900 | 129,100 | 127,400 | 132,500 | 137,800 | 144,100 |
| % | −2.7 | −4.2 | −2.6 | 8.2 | 8.2 | 9.4 |
| Battle Creek | 60,100 | 59,400 | 59,800 | 61,000 | 61,600 | 63,000 |
| % | −4.8 | −2.3 | 1.4 | 4.1 | 2.0 | 4.6 |
| Bay City | 32,500 | 31,900 | 31,600 | 33,000 | 33,900 | 34,600 |
| % | −8.1 | −3.7 | −1.9 | 9.1 | 5.5 | 4.2 |
| Benton Harbor | 56,300 | 54,000 | 54,200 | 54,900 | 56,200 | 57,600 |
| % | −7.7 | −8.0 | 0.7 | 2.6 | 4.8 | 5.0 |
| Flint | 173,900 | 170,700 | 174,700 | 179,900 | 187,200 | 191,300 |
| % | −10.8 | −3.6 | 4.7 | 6.0 | 8.3 | 4.4 |
| Grand Rapids | 262,400 | 260,400 | 262,500 | 270,700 | 276,800 | 286,200 |
| % | −3.9 | −1.5 | 1.6 | 6.3 | 4.6 | 6.9 |
| Jackson | 48,200 | 45,900 | 45,300 | 45,900 | 46,900 | 47,900 |
| % | −8.9 | −9.3 | −2.6 | 2.7 | 4.4 | 4.3 |
| Kalamazoo | 106,200 | 103,900 | 103,500 | 105,000 | 107,800 | 109,800 |
| % | −5.6 | −4.3 | −0.8 | 2.9 | 5.4 | 3.7 |
| Lansing | 184,600 | 183,200 | 186,500 | 188,900 | 192,600 | 197,200 |
| % | −8.1 | −1.5 | 3.6 | 2.6 | 4.0 | 4.8 |
| Muskegon | 57,200 | 55,900 | 54,900 | 55,800 | 56,900 | 58,500 |
| % | −2.1 | −4.5 | −3.5 | 3.3 | 4.0 | 5.7 |
| Saginaw | 76,900 | 77,000 | 76,700 | 78,800 | 81,200 | 84,000 |
| % | −12.5 | 0.3 | −0.8 | 5.6 | 6.2 | 7.0 |
| Southeast | 648,000 | 637,800 | 642,200 | 659,000 | 679,600 | 699,100 |
| % | −8.4 | −3.1 | 1.4 | 5.3 | 6.3 | 5.8 |
| Southwest | 542,200 | 533,600 | 534,900 | 547,400 | 559,300 | 575,100 |
| % | −4.6 | −3.1 | 0.5 | 4.7 | 4.4 | 5.7 |
| Total outstate | 1,190,200 | 1,171,400 | 1,177,100 | 1,206,400 | 1,238,900 | 1,274,200 |
| % | −6.7 | −3.1 | 1.0 | 5.0 | 5.5 | 5.8 |

## INDUSTRIAL OUTLOOK FOR THE LOCALITIES

Further insight into the recovery process can be gained by considering the underlying industrial composition of the projections. The ILIR forecasting system enables employment projections for approximately twenty-five separate industries in each SMSA. For the purpose of this article the industry job forecasts were allocated to three major industrial sectors: manufacturing, private nonmanufacturing, and government.

The average annual employment levels by industrial sector in each SMSA are presented for 1982 (MESC data), 1983, and 1984 in Table 6. The growth rates from the previous year to the indicated year are shown below the corresponding employment numbers. In addition, a set of unemployment rate forecasts for each SMSA is provided. The track record of the forecasting system indicates that manufacturing-industry employment projections generally have been more accurate than those for nonmanufacturing, while the government sector is typically the most difficult to track. Also, much higher levels of accuracy have been achieved in predicting employment than unemployment.

As might be expected from the previous results, industry detail across SMSAs follows the same general pattern. Since the recovery is led by the manufacturing sector and in particular the automotive industry, the expansion of manufacturing employment through 1984 is much more pronounced in the southeast region. In terms of the individual SMSAs, the highest rates of growth in manufacturing employment are projected to occur in five of the six southeastern SMSAs. (Jackson is the exception.) The four largest SMSAs (Grand Rapids, Flint, Lansing, and Ann Arbor) are forecast to have the greatest increases in the number of manufacturing jobs between 1982 and 1984, ranging from five thousand to eleven thousand. Grand Rapids is anticipated to recover — in number — all of its manufacturing jobs lost since 1979. At the other end of the spectrum is Jackson, which is expected to make no net gains on its manufacturing employment losses since 1979. The remaining areas in descending order of manufacturing job recovery are: Lansing (68%), Bay City (54%), Ann Arbor (48%), Flint (47%), Kalamazoo (46%), Saginaw (33%), Muskegon (18%), Battle Creek (17%), and Benton Harbor (13%). It should be noted that the manufacturing-industry projections reflect the expected departure or scaling down of a number of manufacturing concerns.

By 1984 the recovery depicted in the regional forecast has diffused into the private nonmanufacturing sector, albeit at much lower rates of growth than in the manufacturing sector. A significant rebound in construction activity is forecast for many of the SMSAs, especially involving general building and special trade contractors in the residential construction market. The largest increase in nonmanufacturing jobs in terms of numbers, however, is expected to be in the service industries.

As in the case of manufacturing, the four largest SMSAs are expected to experience the greatest increase in employment over the 1982–84 period, ranging from twenty-seven hundred to eighty-two hundred jobs. With the exception of Ann Arbor and Grand Rapids, every SMSA suffered net losses in nonmanufacturing jobs between 1979 and 1982. All but two of these SMSAs are predicted to recoup their losses by 1984. Jackson and Benton Harbor are expected to fall short of 1979 levels by twenty-one hundred and nine hundred nonmanufacturing jobs, respectively.

Government employment levels are forecast to remain relatively stationary across the SMSAs from 1982 to 1984 with a mixture of small losses and small gains. Ann Arbor is the only SMSA forecast to exceed 1979 government employment levels in 1984. Over 90 percent of

**TABLE 6: Annual Forecast for the Outstate SMSAs: Employment by Major Sector and Unemployment Rates, 1982–84***

| Region | 1982 (actual) Total | Man. | Nman. | Govt. | U Rate | 1983 Total | Man. | Nman. | Govt. | U Rate | 1984 Total | Man. | Nman. | Govt. | U Rate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ann Arbor | 130,500 | 31,900 | 54,500 | 44,100 | 9.9 | 130,000 | 31,000 | 55,100 | 43,900 | 9.6 | 141,000 | 39,000 | 57,200 | 44,800 | 7.3 |
| % | −4.1 | −11.6 | −1.3 | −1.6 | 2.1 | −0.4 | −2.8 | 1.1 | −0.5 | −0.3 | 8.5 | 25.8 | 3.8 | 2.1 | −2.3 |
| Battle Creek | 59,700 | 18,000 | 29,800 | 11,900 | 16.1 | 60,500 | 18,100 | 30,500 | 11,900 | 14.8 | 62,300 | 19,000 | 31,200 | 12,100 | 11.9 |
| % | −3.9 | −8.2 | −2.0 | −1.7 | 4.7 | 1.3 | 0.6 | 2.3 | 0.0 | −1.3 | 3.0 | 5.0 | 2.3 | 1.7 | −2.9 |
| Bay City | 32,200 | 8,400 | 18,900 | 4,900 | 16.0 | 32,300 | 8,800 | 18,900 | 4,600 | 16.0 | 34,200 | 9,700 | 19,800 | 4,700 | 12.0 |
| % | −6.4 | −7.7 | −5.0 | −9.3 | 3.6 | 0.3 | 4.8 | 0.0 | −6.1 | 0.0 | 5.9 | 10.2 | 4.8 | 2.2 | −4.0 |
| Benton Harbor | 55,200 | 19,100 | 28,400 | 7,700 | 16.3 | 54,600 | 18,700 | 28,500 | 7,400 | 17.0 | 56,900 | 19,900 | 29,600 | 7,400 | 13.5 |
| % | −6.4 | −9.5 | −3.7 | −8.3 | 3.3 | −1.1 | −2.1 | 0.4 | −3.9 | 0.7 | 4.2 | 6.4 | 3.9 | 0.0 | −3.5 |
| Flint | 172,300 | 61,900 | 83,100 | 27,300 | 20.8 | 177,300 | 65,400 | 84,800 | 27,100 | 16.9 | 189,200 | 72,800 | 88,800 | 27,600 | 13.1 |
| % | −8.2 | −14.7 | −4.4 | −3.2 | 5.7 | 2.9 | 5.7 | 2.0 | −0.7 | −3.9 | 6.7 | 11.3 | 4.7 | 1.8 | −3.8 |
| Grand Rapids | 261,300 | 85,000 | 146,700 | 29,600 | 11.8 | 266,600 | 88,600 | 148,400 | 29,600 | 10.3 | 281,400 | 96,100 | 154,900 | 30,400 | 7.4 |
| % | −2.5 | −5.7 | −0.3 | −3.3 | 2.7 | 2.0 | 4.2 | 1.2 | 0.0 | −1.5 | 5.6 | 8.5 | 4.4 | 2.7 | −2.9 |
| Jackson | 47,000 | 12,000 | 27,000 | 8,000 | 16.3 | 45,700 | 11,000 | 26,700 | 8,000 | 17.0 | 47,400 | 11,900 | 27,400 | 8,100 | 14.6 |
| % | −7.5 | −15.5 | −4.3 | −4.8 | 4.8 | −2.8 | −8.3 | −1.1 | 0.0 | 0.7 | 3.7 | 8.2 | 2.6 | 1.3 | −2.4 |
| Kalamazoo | 105,100 | 31,200 | 54,500 | 19,400 | 11.0 | 104,300 | 31,100 | 54,000 | 19,200 | 10.4 | 108,800 | 33,400 | 55,900 | 19,500 | 8.0 |
| % | −4.1 | −5.5 | −3.9 | −2.5 | 2.3 | −0.8 | −0.3 | −0.9 | −1.0 | −0.6 | 4.3 | 7.4 | 3.5 | 1.6 | −2.4 |
| Lansing | 184,000 | 37,200 | 83,400 | 63,400 | 12.1 | 187,700 | 38,800 | 85,900 | 63,000 | 11.2 | 194,900 | 42,300 | 89,100 | 63,500 | 8.8 |
| % | −4.5 | −9.0 | −3.5 | −3.1 | 1.9 | 2.0 | 4.3 | 3.0 | −0.6 | −0.9 | 3.8 | 9.0 | 3.7 | 0.8 | −2.4 |
| Muskegon | 56,600 | 18,600 | 28,300 | 9,700 | 17.7 | 55.400 | 18,100 | 28,200 | 9,100 | 18.0 | 57,700 | 19,300 | 29,200 | 9,200 | 14.5 |
| % | −3.1 | −6.5 | 0.0 | −4.9 | 4.0 | −2.1 | −2.7 | −0.4 | −6.2 | 0.3 | 4.2 | 6.6 | 3.5 | 1.1 | −3.5 |
| Saginaw | 76,900 | 24,200 | 41,500 | 11,200 | 17.1 | 77,800 | 24,700 | 41,800 | 11,300 | 14.4 | 82,600 | 28,100 | 43,100 | 11,400 | 10.4 |
| % | −8.2 | −17.4 | −3.9 | −0.9 | 5.0 | 1.2 | 2.1 | 0.7 | 0.9 | −2.7 | 6.2 | 13.8 | 3.1 | 0.9 | −4.0 |
| Southeast | 642,900 | 175,600 | 308,400 | 158,900 | 15.3 | 650,800 | 179,700 | 313,200 | 157,900 | 13.6 | 689,300 | 203,800 | 325,400 | 160,100 | 10.5 |
| % | −6.2 | −13.2 | −3.6 | −2.8 | 3.7 | 1.2 | 2.3 | 1.6 | −0.6 | −1.7 | 5.9 | 13.4 | 3.9 | 1.4 | −3.1 |
| Southwest | 537,900 | 171,900 | 287,700 | 78,300 | 13.3 | 541,400 | 174,600 | 289,600 | 77,200 | 12.4 | 567,100 | 187,700 | 300,800 | 78,600 | 9.4 |
| % | −3.4 | −6.4 | −1.5 | −3.6 | 3.1 | 0.7 | 1.6 | 0.7 | −1.4 | −0.9 | 4.7 | 7.5 | 3.9 | 1.8 | −3.0 |
| Total outstate | 1,180,800 | 347,500 | 596,100 | 237,200 | 14.4 | 1,192,200 | 354,300 | 602,800 | 235,100 | 13.1 | 1,256,400 | 391,500 | 626,200 | 238,700 | 10.0 |
| % | −5.0 | −10.0 | −2.6 | −3.1 | 3.5 | 1.0 | 2.0 | 1.1 | −0.9 | −1.3 | 5.4 | 10.5 | 3.9 | 1.5 | −3.1 |

*The first row for each SMSA indicates the average level of employment and the unemployment rate (%) for the calendar year. The second row contains the annual growth rate (%) from the previous year to the indicated year, except for the unemployment rate, which is expressed in terms of nominal differences. The values for 1982 are estimates provided by the Michigan Employment Security Commission and are based on the 1982 benchmark. The forecast date is May 1983.

the government workers located in the outstate SMSAs are employed in the state or local government divisions. The problems of revenue shortfall plaguing the state government have been well advertised lately, and some staff reductions have been proposed. Public universities and colleges, comprising a large part of state government in several of the SMSAs, are in the process of reorganization in order to adjust to a falling share of state support. A large portion of local government employment in the SMSAs is associated with public school education, and this sector is also having to adapt to ongoing revenue constraints and declining enrollment.

The unemployment situation is expected to improve over the forecast horizon, ranging from a 1.7 percentage-point decline in Jackson to a 7.7 percentage-point decline in Flint between 1982 and 1984. The unemployment rates across SMSAs, however, are expected to remain higher in 1984 than in 1979, with percentage-point differentials ranging from 1.5 (Ann Arbor) to 7.4 (Jackson). This situation results in large part from the addition of job seekers to the labor force.

## SUMMARY

A system of regional econometric models has been constructed at the Institute of Labor and Industrial Relations, University of Michigan, in order to produce forecasts of labor market activity for the SMSAs of Michigan. This article reports on the results of a two-year forecast generated for the outstate SMSAs in May 1983. The forecast shows job recovery across all of the areas by the second half of 1983, with some acceleration of the increase in jobs during 1984. The recovery is led by the manufacturing sector, which displays the most rapid growth in the automobile-based economies located in the southeast region of the state.

From 1979 to 1982, 113,500 jobs were lost in the outstate SMSAs, 76,300 of these in the southeast. During 1983 and 1984, the extent of the forecast horizon, it is predicted that 75,600 jobs will be regained. This leaves a shortfall from 1979 levels of 37,900 jobs — 29,900 in the southeast and 8,000 in the southwest.

The local-area forecast is predicated on an economic recovery at the national level, where strong growth is projected for the second half of 1983 and for 1984. Although it is evident that this national economic recovery is under way in the first quarter of 1983, the recovery path may be disturbed by unfavorable developments in federal fiscal policy or by the actions of the Federal Reserve Board. Specifically, the forecasts at both the national and local levels are contingent upon a decline in the federal budget deficit, a moderate expansion of the money supply over the forecast period, and continuation of a lower interest-rate regime for the private economy.

## NOTE

1. The authors would like to express their appreciation to Saul H. Hymans and Joan P. Crary for this information and for their ongoing support of the regional forecasting efforts.

# Brief

Michigan manufacturers spent $3.6 billion on research and development (R & D) during 1979 according to the most recent tabulations by the National Science Foundation. That figure represented 9.5 percent of the $38 billion national total. By way of comparison, Michigan contains about 4 percent of the nation's population, and in a typical year approximately 6 percent of manufacturing activity takes place here.

The federal government sponsored nearly a third of the nation's industrial R & D; most government sponsored R & D is devoted to missiles, aircraft, and other military applications. Michigan accounted for approximately 1 percent of federally funded R & D. Of the remainder, the $25.5 billion in company funded R & D, $3.4 billion or over 13 percent was spent in the Wolverine State.

Basic research, defined as scientific investigation conducted primarily for enlarging the fund of human knowledge, represented $1.1 billion or 3 percent of the national R & D total; $7.2 billion (19 percent) was spent on applied research, that undertaken with a specific commercial objective. The bulk of R & D spending goes for development, i.e., technical activities concerned with translating knowledge into products or processes, but does not include product testing, marketing research, and other activities downstream from the laboratory.

The five largest industrial categories of national R & D, accounting for 78 percent of the 1979 total, are: aircraft and missiles, $8,454 million; electrical equipment and electronics, $7,646 million, machinery, $5,126 million; motor vehicles, $4,429 million; and chemicals (including pharmaceuticals), $4,035 million. The division of R & D by industry is not available for states. Patent statistics, which can be analyzed on a state-by-state basis, show that during 1980 ten companies were granted twenty or more patents with a Michigan origin.

| | Number of patents | |
|---|---|---|
| Company | Michigan | United States |
| General Motors | 188 | 326 |
| Upjohn | 148 | 170 |
| Dow | 144 | 259 |
| Ford Motor | 133 | 145 |
| BASF | 47 | 56 |
| Bendix | 43 | 131 |
| Eaton | 42 | 104 |
| Dow Corning | 26 | 31 |
| Chrysler | 23 | 25 |
| Ethyl | 23 | 50 |

These companies accounted for 817 or 38 percent of the 2,167 patents granted in Michigan and 63 percent of the U.S. patents granted to those companies. These figures, along with tabulations of patents classified on a product basis, suggest that 25–30 percent of the patents granted in Michigan are related to motor vehicles, 20–25 percent to pharmaceuticals and other chemicals, and 15–20 percent to machinery, including materials handling equipment. Michigan is weak in R & D in the fields of aircraft, electronics, petroleum, rubber, textiles, apparel, food, tobacco, and stone, clay, and glass products.

In total patents Michigan had 5.5 percent of the national total during 1979 a figure well below our nine and one-half percent of R & D. On the theory that research is more likely to have a patentable result than is development, this difference suggests that emphasis on development is even more pronounced here than nationally. Michigan's greater concentration on development also is borne out in recently released employment figures for the high-technology occupations. In 1980, the date of the latest Census of Population, 4.4 percent of the nations engineers and 4.0 percent of the nation's engineering and science technicians were employed in Michigan, compared with only 3 percent of the computer specialists and 2.9 percent of the scientists. That these proportions of engineering and science personnel are well below our proportion of R & D points to another Michigan phenomenon: a very high volume of R & D activity per person so employed, suggesting a high concentration of R & D among relatively few companies.

In summary, Michigan R & D is concentrated in the broad categories of metals technology and chemicals, focuses heavily on development as opposed to research, and is dominated by big, not small, business.

**TABLE 1: Research and Development and Patent Activity in Michigan: 1963–1981**

| | Research and development spending | | | | | |
|---|---|---|---|---|---|---|
| | Federal funds | | Company funds | | Patents | |
| Year | ($000,000) | percentage | ($000,000) | percentage | number | percentage |
| 1963 | 65 | .9 | 797 | 14.9 | 2,347 | 6.3 |
| 1964 | 65 | .9 | 835 | 14.5 | 2,433 | 6.3 |
| 1965 | 64 | .8 | 895 | 14.6 | 3,135 | 6.2 |
| 1966 | 98 | 1.2 | 977 | 13.5 | 3,675 | 6.4 |
| 1967 | 115 | 1.4 | 952 | 11.9 | 3,306 | 6.1 |
| 1968 | 98 | 1.1 | 1,086 | 12.2 | 2,968 | 6.1 |
| 1969 | 83 | 1.0 | 1,228 | 12.5 | 3,160 | 5.9 |
| 1970 | 77 | 1.0 | 1,171 | 11.6 | 2,831 | 5.7 |
| 1971 | 78 | 1.0 | 1,338 | 12.6 | 3,386 | 5.8 |
| 1972 | 86 | 1.1 | 1,500 | 13.2 | 3,156 | 5.8 |
| 1973 | 56 | .7 | 1,832 | 14.4 | 3,091 | 5.7 |
| 1974 | 78 | .9 | 1,990 | 14.2 | 3,215 | 5.6 |
| 1975 | 114 | 1.3 | 1,858 | 12.6 | 2,832 | 5.7 |
| 1976 | 124 | 1.3 | 2,248 | 12.9 | 2,961 | 5.2 |
| 1977 | 144 | 1.4 | 2,614 | 13.5 | 2,474 | 5.2 |
| 1978 | n.a. | n.a. | n.a. | n.a. | 2,373 | 5.3 |
| 1979 | 150 | 1.2 | 3,439 | 13.5 | 1,875 | 5.5 |
| 1980 | n.a. | n.a. | n.a. | n.a. | 2,130 | 5.6 |
| 1981 | n.a. | n.a. | n.a. | n.a. | 2,457 | 5.7 |

SOURCE: Developed from National Science Foundation and Commissioner of Patents and Trademarks data.
n.a.: not available.

**TABLE 2: Michigan Experienced Labor Force in High-Technology Occupations: 1970 and 1980**

| | Number | | Percentage of U.S. | |
|---|---|---|---|---|
| Occupation | 1970 | 1980 | 1970 | 1980 |
| Engineers | 55,089 | 65,048 | 4.4 | 4.4 |
| Engineering and science technicians | 39,309 | 45,670 | 4.7 | 4.0 |
| Computer specialists | 9,463 | 17,748 | 3.6 | 3.0 |
| Scientists | 6,908 | 9,061 | 3.3 | 2.9 |
| Mathematicians | 1,010 | 1,304 | 2.8 | n.a. |

SOURCE: Developed from Census of Population and Current Population Survey.
n.a.: not available.

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# Quarterly Personal Income in Michigan

| | Millions of dollars, annual rates, seasonally adjusted | | | | | | | Percentage change | |
|---|---|---|---|---|---|---|---|---|---|
| | 1981 | | | | 1982 | | | 82(2) to 82(3) | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | Michigan | United States |
| **TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK** | | | | | | | | | |
| **BY TYPE** | | | | | | | | | |
| Wage and salary disbursements | 59,988 | 61,364 | 61,856 | 60,274 | 60,380 | 61,853 | 61,830 | — | +8.5 |
| Other labor income | 7,523 | 7,800 | 7,938 | 7,765 | 7,951 | 8,355 | 8,373 | + .2 | +2.0 |
| Proprietors income | 4,360 | 4,362 | 4,395 | 4,299 | 4,108 | 4,142 | 4,218 | + 1.8 | + .8 |
| Farm | 423 | 445 | 537 | 489 | 353 | 354 | 330 | − 6.7 | −4.8 |
| Nonfarm | 3,937 | 3,917 | 3,858 | 3,810 | 3,755 | 3,788 | 3,889 | + 2.7 | +1.8 |
| **BY INDUSTRY** | | | | | | | | | |
| Farm | 680 | 699 | 788 | 740 | 610 | 619 | 603 | − 2.6 | −2.0 |
| Nonfarm | 71,192 | 72,828 | 73,401 | 71,598 | 71,829 | 73,730 | 73,818 | + .1 | +1.0 |
| Private | 61,575 | 63,170 | 63,699 | 61,803 | 62,086 | 63,732 | 63,718 | — | + .9 |
| Ag. Serv., For., Fish., and other | 171 | 169 | 169 | 170 | 166 | 162 | 162 | — | +2.8 |
| Mining | 363 | 396 | 433 | 413 | 424 | 344 | 337 | − 2.0 | −4.4 |
| Construction | 3,121 | 3,114 | 2,994 | 2,938 | 2,809 | 2,633 | 2,793 | + 6.1 | − .4 |
| Manufacturing | 29,431 | 30,355 | 30,596 | 28,693 | 28,964 | 30,568 | 29,931 | − 2.1 | − .3 |
| Nondurable goods | 4,679 | 4,865 | 4,857 | 4,680 | 4,833 | 5,002 | 4,993 | − .2 | + .4 |
| Durable goods | 24,753 | 25,490 | 25,739 | 24,013 | 24,132 | 25,566 | 24,938 | − 2.4 | − .7 |
| Transportation and public utilities | 4,056 | 4,197 | 4,270 | 4,192 | 4,265 | 4,272 | 4,226 | − 1.1 | + .4 |
| Wholesale trade | 3,778 | 3,861 | 3,944 | 4,006 | 3,952 | 3,906 | 3,934 | + .7 | + .8 |
| Retail trade | 6,299 | 6,391 | 6,514 | 6,380 | 6,293 | 6,326 | 6,483 | + 2.5 | +1.4 |
| Finance, insurance, and real estate | 2,861 | 2,966 | 2,993 | 3,035 | 3,060 | 3,118 | 3,204 | + 2.8 | +3.2 |
| Services | 11,495 | 11,722 | 11,787 | 11,976 | 12,151 | 12,402 | 12,648 | + 2.0 | +2.8 |
| Government and government enterprise | 9,617 | 9,658 | 9,702 | 9,795 | 9,743 | 9,998 | 10,100 | + 1.0 | +1.3 |
| Federal, civilian | 1,215 | 1,214 | 1,238 | 1,264 | 1,240 | 1,283 | 1,310 | + 2.1 | +1.7 |
| Federal, military | 226 | 229 | 236 | 268 | 264 | 267 | 272 | + 1.9 | + .2 |
| State and local | 8,176 | 8,215 | 8,227 | 8,264 | 8,239 | 8,449 | 8,518 | + .8 | +1.3 |
| **DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE** | | | | | | | | | |
| Total labor and proprietors income by place of work | 71,871 | 73,527 | 74,189 | 72,338 | 72,439 | 74,349 | 74,421 | + .1 | + .9 |
| Less: Personal contributions for social insurance by place of work | 3,828 | 3,910 | 3,921 | 3,794 | 3,915 | 4,001 | 3,998 | − .1 | + .9 |
| Net labor and proprietors income by place of work | 68,043 | 69,617 | 70,268 | 68,544 | 68,524 | 70,349 | 70,423 | + .1 | + .9 |
| Plus: Residence adjustment | 468 | 467 | 475 | 476 | 472 | 472 | 477 | + 1.0 | +1.0 |
| Net labor and proprietors income by place of residence | 68,511 | 70,084 | 70,744 | 69,020 | 68,996 | 70,821 | 70,900 | + .1 | + .9 |
| Plus: Dividends, interest, and rent | 14,384 | 15,112 | 15,964 | 16,461 | 16,826 | 17,320 | 17,761 | + 2.5 | +2.4 |
| Plus: Transfer payments | 13,970 | 14,030 | 14,305 | 14,673 | 14,727 | 15,555 | 15,686 | + .8 | +4.2 |
| State U.I. benefits | 1,071 | 1,251 | 1,058 | 1,472 | 1,445 | 2,027 | 1,634 | −19.4 | +8.0 |
| Transfers excluding state U.I. | 12,899 | 12,779 | 13,247 | 13,201 | 13,282 | 13,526 | 14,052 | + 3.9 | +4.0 |
| Personal income by place of residence | 96,864 | 99,225 | 101,012 | 100,154 | 100,549 | 103,697 | 104,347 | + 3.1 | +1.7 |

SOURCE: Bureau of Economic Analysis, special release.

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# County Income Patterns

by DAVID I. VERWAY, *Director, Bureau of Business Research, School of Business Administration, Wayne State University*

The earnings growth comparisons of Michigan counties are based on data recently released by the Bureau of Economic Analysis. BEA county earnings estimates are developed from reports that employers file with state employment agencies and from tax returns filed with the Internal Revenue Service. Total earnings are comprised of labor income and the net incomes of nonincorporated business enterprises—proprietary motels, restaurants, and grocery stores—as well as the businesses of professionals, such as physicians, dentists, lawyers, and trade contractors. These data are the best available yardsticks of economic activity taking place in counties, although they are not as comprehensive as gross national product accounts for the United States. Michigan counties are ranked in Table 1 on the basis of earnings growth rates between 1980 and 1981.

Ontonagon led Michigan counties in earnings growth between 1980 and 1981. An increase in copper extraction at the White Pine Mine provided the major stimulus. To the north in the city of Ontonagon, the Upper Peninsula Shipbuilding Company (UPSCO) was adding to its labor force so it could fulfill its contract with the State of Michigan. UPSCO was formed in the late 1970s in order to build barges to carry freight across Lake Michigan. The new vessels are intended to replace car ferries being retired by the railroads. In the wake of payroll gains at White Pine and UPSCO and the third major employer, Hoerner Waldorf, a paper company, local transportation companies, retailers, and providers of services enjoyed their best year since 1975. White Pine experienced substantial reductions in the mid-1970s following management's decision to stop losing money as a supplier to the automotive industry.

Natural resources also were responsible for outsize earnings gains in two northern Lower Peninsula counties. In addition to two natural gas purification plants, Kalkaska has a growing oil and gas drilling and producing industry which has made it Michigan's county with the fastest growing economy during the past decade. Isabella county is home to a number of companies that service the oil and gas industry. It too has enjoyed economic growth well above state and national averages. Both counties host small but growing durable goods pro-

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**Michigan Statistical Abstract, 1982–83, 17th edition**

Statistics in the accompanying article were drawn from this edition of the *ABSTRACT*. In all, there are 45 tables in this *ABSTRACT* based on the county income figures compiled by the Bureau of Economic Analysis. Other growth comparisons can be developed from Michigan Employment Security Commission figures, also available in the *ABSTRACT*.

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## TABLE 1

### Ranking of Michigan Counties According to Growth in Labor and Proprietors' Earnings by County in Which Earned: 1980–81

| | % change | | | % change | |
|---|---|---|---|---|---|
| **County** | **1971–81** | **1980–81** | **County** | **1971–81** | **1980–81** |
| Ontonagon | 90 | 24 | Berrien | 98 | 6 |
| Kalkaska | 642 | 23 | Oakland | 192 | 6 |
| Monroe | 167 | 18 | Benzie | 137 | 6 |
| Isabella | 202 | 18 | Leelanau | 110 | 6 |
| Osceola | 151 | 13 | Calhoun | 117 | 6 |
| Hillsdale | 136 | 13 | St. Joseph | 136 | 6 |
| Genesee | 142 | 13 | Ogemaw | 200 | 6 |
| Delta | 157 | 13 | Livingston | 208 | 6 |
| Mackinac | 150 | 13 | Branch | 143 | 6 |
| St. Clair | 141 | 12 | Muskegon | 130 | 5 |
| Chippewa | 60 | 11 | Lapeer | 145 | 5 |
| Ingham | 163 | 11 | Eaton | 146 | 5 |
| Presque Isle | 143 | 11 | Alcona | 135 | 5 |
| Bay | 130 | 11 | Mason | 88 | 5 |
| Iron | 138 | 11 | Emmet | 142 | 5 |
| Montcalm | 146 | 10 | Sanilac | 103 | 5 |
| Menominee | 164 | 10 | Lenawee | 95 | 5 |
| Marquette | 178 | 10 | Schoolcraft | 145 | 4 |
| Allegan | 158 | 9 | Manistee | 135 | 4 |
| Clinton | 167 | 9 | Oscoda | 114 | 4 |
| Ionia | 164 | 9 | Alger | 128 | 4 |
| Wexford | 180 | 9 | Shiawassee | 103 | 3 |
| Kent | 168 | 8 | Gratiot | 136 | 3 |
| Keweenaw | 4 | 8 | Gladwin | 160 | 3 |
| Saginaw | 132 | 8 | Wayne | 88 | 3 |
| Kalamazoo | 163 | 8 | Macomb | 128 | 3 |
| Ottawa | 188 | 8 | Luce | 157 | 2 |
| Clare | 147 | 8 | Alpena | 127 | 2 |
| Newaygo | 112 | 8 | Tuscola | 153 | 2 |
| Otsego | 274 | 8 | Huron | 140 | 1 |
| Crawford | 179 | 8 | Lake | 52 | 1 |
| Van Buren | 139 | 8 | Barry | 126 | 1 |
| Midland | 155 | 7 | Cheboygan | 149 | 1 |
| Iosco | 94 | 7 | Gogebic | 88 | 0 |
| Grand Traverse | 219 | 7 | Oceana | 146 | 0 |
| Cass | 133 | 7 | Baraga | 102 | −1 |
| Washtenaw | 192 | 7 | Antrim | 143 | −1 |
| Jackson | 125 | 7 | Mecosta | 166 | −1 |
| Missaukee | 163 | 7 | Dickinson | 159 | −2 |
| Roscommon | 175 | 6 | Montmorency | 82 | −6 |
| Charlevoix | 178 | 6 | | | |
| Arenac | 159 | 6 | Michigan | 129 | 6 |
| Houghton | 141 | 6 | United States | 157 | 10 |

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

ducing sectors as well. Construction, retailing, and services have benefited from growth in oil and gas activity and manufacturing.

Detroit Edison was responsible for putting Monroe and St. Clair counties among Michigan's top ten in earnings growth between 1980 and 1981. In Monroe County, Edison was installing pollution controls at its coal-fired electric generating plant. Edison also accelerated construction of Fermi Two, a nuclear generating plant. In St. Clair County, construction work at the Bells River coal-fired generating plant was responsible for relatively high earnings growth.

Osceola County has growing nursing home and personal health care industries that draw retirees from further south. In addition, cutbacks at Traverse City Regional Psychiatric Hospital have caused an influx of patients seeking half-way house care in Osceola County.

Hillsdale and Genesee counties, sixth and seventh in earnings growth between 1980 and 1981, benefited from the modest 1981 improvement in vehicle production in this state. Hillsdale has a number of supplier factories, and Genesee is home to the Buick Motor Car Division. There are other large General Motors factories in Flint. GM payrolls account for well over half the earnings in Genesee County, the county most dependent on durable goods manufacturing in the state.

The other two counties in the top ten growth listing for Michigan are Delta and Mackinac. In the former, Mead Paper Company increased production at its newly expended plant in Escanaba. Mackinac County was buoyed by increased construction activity plus recovery in tourism, the backbone of that small economy.

At the other extreme, Montmorency became Michigan's most depressed county when an automotive supplier shifted its operations to Mexico. In Dickinson County, Michigan's last underground iron ore mine was closed due to high costs and depressed markets. Factory closings affected Mecosta and Antrim counties. Manufacturing activity was weak in Baraga, Oceana, and Gogebic counties. Mecosta, Antrim, and Oceana experienced declining agricultural earnings. Construction activity declined sharply in Mecosta, Antrim, and Baraga counties. It should be borne in mind that none of the declining economies is sizeable; relatively small numerical changes underlay those percentages.

Generally speaking, Michigan's rural counties are dependent on urban counties as markets either for goods or for tourism and outdoor recreation. Since they do have these narrow specialties, they are more volatile than their more diversified urban markets.

Over the long term, the counties which grew more rapidly than the national average are the least populous. Exceptions are Oakland, Washtenaw, Kent, and Ingham. Oakland has developed an office/service base to complement the manufacturing economies of Wayne and Macomb. Washtenaw has a high-technology emphasis. Kent is the home of several rapidly growing office furniture companies as well as being the financial and commercial capital of Western Michigan. Ingham hosts the state government, Michigan State University, and Oldsmobile.

With the exception of Oakland, Washtenaw, and Ottawa, counties that grew exceptionally rapidly (175 percent or more earnings gain between 1971 and 1981) are located in Northern Michigan.

Tables 2 and 3 focus on the counties where the various broadly defined kinds of economic activity are most and least prominent. GM is the major anchor in Genesee and Saginaw, whereas the chemical industry dominates Midland (Dow Chemical and Dow Corning). The economic health of St. Joseph County depends on its automotive suppliers. Macomb County also is heavily automotive. Ottawa County has a sizeable proportion of the

## TABLE 2

### Michigan Counties Most and Least Dependent on Manufacturing; Selected Services; Retail Trade; and Transportation, Communication and Public Utilities (TPCU) in Their Economic Base: 1981

| Manufacturing | | | Selected Services | | | Retail Trade | | | TCPU | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| County | Dependency[a] | Growth 1980–81[b] | County | Dependency[a] | Growth 1980–81[b] | County | Dependency[a] | Growth 1980–81[b] | County | Dependency[a] | Growth 1980–81[b] |
| **Ten Most Dependent** | | | | | | | | | | | |
| Genesee | 58.49 | 19 | Emmet | 35.48 | 12 | Keweenaw | 23.05 | 44 | St. Clair | 14.23 | 0.05 |
| Midland | 55.02 | 2 | Crawford | 31.10 | 15 | Clare | 22.17 | 9 | Shiawassee | 11.22 | 0.007 |
| Saginaw | 50.95 | 13 | Leelanau | 29.09 | 11 | Roscommon | 20.53 | 12 | Chippewa | 10.50 | 0.06 |
| St. Joseph | 50.89 | 4 | Oakland | 24.55 | 12 | Cheboygan | 20.04 | 13 | Mason | 9.81 | 0.03 |
| Macomb | 49.88 | 3 | Grd. Traverse | 22.89 | 10 | Montmorency | 19.62 | 2 | Dickinson | 9.46 | 0.02 |
| Ottawa | 48.73 | 13 | Keweenaw | 21.85 | 5 | Lake | 18.87 | 3 | Alpena | 9.38 | −0.05 |
| Manistee | 48.69 | 5 | Gogebic | 21.75 | 15 | Ogemaw | 18.63 | 4 | Delta | 8.98 | 0.04 |
| Lenawee | 48.07 | 6 | Clare | 19.70 | 6 | Missaukee | 18.35 | 10 | Tuscola | 7.88 | 0.06 |
| Muskegon | 47.37 | 8 | Mackinac | 19.32 | 6 | Alcona | 18.34 | 8 | Ogemaw | 7.83 | 0.03 |
| Allegan | 46.86 | 17 | Wexford | 18.77 | 9 | Arenac | 18.28 | 6 | Schoolcraft | 7.59 | 0.09 |
| **Five Least Dependent** | | | | | | | | | | | |
| Marquette | 2.91 | 0 | Kalkaska | 6.02 | 26 | Midland | 5.07 | 7 | Ontonagon | 1.46 | 0.001 |
| Luce | 2.94 | −17 | Menominee | 7.41 | 17 | Ontonagon | 5.67 | 11 | Osceola | 1.62 | 0.08 |
| Lake | 3.22 | 4 | St. Joseph | 7.65 | 18 | Washtenaw | 6.34 | 4 | Leelanau | 1.92 | 0.01 |
| Presque Isle | 3.38 | 38 | Branch | 7.65 | 7 | Genesee | 6.92 | 4 | Montcalm | 2.09 | −0.02 |
| Mackinac | 4.08 | 9 | Ionia | 8.38 | 5 | Ingham | 7.02 | 3 | Clinton | 2.21 | 0.08 |
| Michigan | 40.41 | 8 | Michigan | 16.15 | 9 | Michigan | 8.77 | 4 | Michigan | 5.76 | 0.06 |
| United States | 25.67 | 9 | United States | 18.10 | 13 | United States | 9.42 | 8 | United States | 7.75 | 0.09 |

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.
a. Earnings in this sector as a percentage of total labor and proprietors' earnings.
b. Percentage change in labor and proprietors' earnings in this sector.

## TABLE 3

### Michigan Counties Most and Least Dependent on Wholesale Trade; Construction; Finance, Insurance, and Real Estate; and Agriculture in Their Economic Base: 1981

| Wholesale Trade | | | Construction | | | Finance, Insurance and Real Estate | | | Agriculture | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| County | Dependency[a] | Growth 1980–81[b] | County | Dependency[a] | Growth 1980–81[b] | County | Dependency[a] | Growth 1980–81[b] | County | Dependency[a] | Growth 1980–81[b] |
| **Ten Most Dependent** | | | | | | | | | | | |
| Oakland | 8.79 | 3 | Montmorency | 16.28 | −6 | Eaton | 8.90 | 6 | Missaukee | 23.95 | 4 |
| Dickinson | 8.72 | −2 | Monroe | 16.07 | (D) | Livingston | 7.36 | 9 | Sanilac | 19.61 | −3 |
| Tuscola | 8.64 | 3 | Kalkaska | 15.96 | 6 | Montmorency | 7.29 | 5 | Huron | 18.53 | −18 |
| Kent | 8.33 | 8 | Midland | 15.73 | 30 | Lake | 7.26 | −1 | Oceana | 15.32 | −3 |
| Branch | 7.17 | 0 | Alcona | 14.58 | −2 | Calhoun | 6.20 | 7 | Tuscola | 15.22 | −13 |
| Huron | 6.84 | 10 | St. Clair | 11.32 | 62 | Oakland | 6.15 | 2 | Gratiot | 13.56 | −5 |
| Genesee | 6.34 | 15 | Cheboygan | 10.70 | 1 | Misaukee | 5.64 | 8 | Arenac | 12.94 | −8 |
| Bay | 5.81 | 10 | Mackinac | 10.25 | 30 | Gladwin | 5.59 | 9 | Clinton | 11.81 | 3 |
| Menominee | 5.77 | −5 | Iron | 10.24 | 6 | Grand Traverse | 5.42 | 11 | Cass | 11.65 | 2 |
| Wayne | 5.75 | 4 | Leelanau | 9.78 | 5 | Roscommon | 5.22 | 2 | Leelanau | 9.00 | −22 |
| **Five Least Dependent** | | | | | | | | | | | |
| Ontonagon | 0.56 | (D) | Luce | 1.77 | −2 | Allegan | 1.37 | 3 | Keweenaw | 0.00 | x |
| Midland | 0.65 | −9 | Ontonagon | 1.96 | 33 | Alcona | 1.43 | (D) | Crawford | 0.00 | x |
| Schoolcraft | 0.90 | 13 | Branch | 2.15 | −29 | Luce | 1.43 | 3 | Wayne | 0.02 | −8 |
| Alger | 1.14 | 14 | Lenawee | 2.38 | −3 | Midland | 1.50 | 9 | Oakland | 0.05 | −17 |
| Baraga | 1.18 | (D) | Washtenaw | 2.45 | −8 | Ontonagon | 1.77 | 13 | Roscommon | 0.13 | −3 |
| Michigan | 5.36 | 6 | Michigan | 4.17 | −2 | Michigan | 4.08 | 4 | Michigan | 1.00 | −2 |
| United States | 6.87 | 10 | United States | 5.61 | 4 | United States | 5.84 | 10 | United States | 1.99 | 19 |

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.
a. Earnings in this sector as a percentage of total labor and proprietors' earnings.
b. Percentage change in labor and proprietors' earnings in this sector.
(D). Withheld to avoid disclosing data for individual companies.
x. Earnings not reported.

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# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 40.4 | 41.8 | 42.4 (Apr.) |
| Average weekly hours, U.S. | 38.7 | 39.6 | 39.8 (Apr.) |
| Average hourly earnings, Michigan ($) | 11.12 | 11.41 | 11.53 (Apr.) |
| Average hourly earnings, U.S. ($) | 8.42 | 8.74 | 8.77 (Apr.) |
| U.S. motor vehicle production (units) | 674,856 | 796,232 | 722,836 (Mar.) |
| Electricity usage (mil. kwh.): | | | |
| Michigan | 5,415 | 5,683 | 5,319 (Feb.) |
| United States | 182,805 | 179,122 | 173,596 (Feb.) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 592 | 675 | 656 (Apr.) |
| United States (000 net tons) | 6,982 | 7,127 | 7,292 (Apr.) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 283.7 | 292.4 | 294.9 (Apr.) |
| United States | 284.3 | 293.4 | 295.5 (Apr.) |
| U.S. producer price index (1967 = 100) | 298.0 | 300.5 | 300.8 (Apr.) |
| Michigan farm prices received index (1977 = 100) | 139 | 119 | 122 (Apr.) |

SOURCE: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administration.

# Contracts for Future Building, First 4 Months: 1982 and 1983

(Thousands of Dollars)

| Area | Nonresidential | | | Residential | | | Total[a] | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1982 | 1983 | Percentage change | 1982 | 1983 | Percentage change | 1982 | 1983 | Percentage change |
| Ann Arbor | 28,648 | 16,399 | − 43 | 5,362 | 7,737 | + 44 | 34,010 | 24,136 | − 29 |
| Battle Creek | 12,594 | 2,507 | − 80 | 2,585 | 4,578 | + 77 | 15,179 | 7,085 | − 53 |
| Bay City | 4,600 | 7,475 | + 63 | 1,114 | 3,146 | +182 | 5,714 | 10,621 | + 86 |
| Detroit | 119,082 | 128,958 | + 8 | 58,711 | 134,351 | +129 | 177,793 | 263,309 | + 48 |
| Flint | 7,107 | 7,519 | + 6 | 8,569 | 6,577 | − 23 | 15,676 | 14,096 | − 10 |
| Grand Rapids | 18,443 | 24,922 | + 35 | 17,663 | 43,192 | +145 | 36,106 | 68,114 | + 89 |
| Jackson | 3,086 | 1,657 | − 46 | 2,265 | 5,083 | +124 | 5,351 | 6,740 | + 26 |
| Kalamazoo-Portage | 104,001 | 3,799 | − 96 | 9,508 | 12,400 | + 30 | 113,509 | 16,199 | − 86 |
| Lansing-East Lansing | 6,055 | 14,156 | +134 | 8,012 | 20,088 | +151 | 14,067 | 34,244 | +143 |
| Muskegon-Norton Shores-Muskegon Heights | 528 | 2,987 | +466 | 3,463 | 7,241 | +109 | 3,991 | 10,228 | +156 |
| Saginaw | 1,808 | 2,594 | + 43 | 2,117 | 4,023 | + 90 | 3,925 | 6,617 | + 69 |
| Toledo | 41,539 | 32,778 | − 21 | 13,881 | 30,750 | +122 | 55,420 | 63,528 | + 15 |
| Michigan | 321,873 | 254,573 | − 21 | 172,473 | 354,166 | +105 | 494,346 | 608,739 | + 23 |

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

Note: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing-East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; Muskegon-Norton Shores-Muskegon Heights includes Muskegon and Oceana counties; and Toledo includes Monroe County, Michigan, and Fulton, Lucas, Ottawa, and Wood counties, Ohio.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1982 and 1983 figures for nonbuilding construction contracts were $162,953,000 and $174,807,000 respectively or an increase of 7 percent. Total building and nonbuilding construction contracts increased by 19 percent in Michigan.

office furniture industry of the Grand Rapids area. Surprising to some perhaps, Wayne County does not appear among the most heavily manufacturing dependent. Reflecting the closure of or decline in so many of its factories, Wayne ranked fourteenth in the importance of manufacturing to county makeup.

The importance of tourism and outdoor recreation in Northern Michigan is reflected in county rankings according to selected services and retail trade. The only southern Michigan county in these rankings, Oakland, has a service sector heavily dominated by professional and business services, not tourism. Oakland is at the top of the list of counties where wholesale trade is most prominent, another indication of its satellite relationship to Wayne and Macomb counties.

The Thumb Area and Missaukee, Oceana, and Gratiot counties are heavily influenced by events in the markets for navy beans, cherries, apples, asparagus, and cucumbers. With recently depressed farm earnings, these regions have been affected accordingly.

## RESIDENCE ADJUSTMENT

The numbers in Tables 1 through 3 focus on economic activity taking place within counties, regardless of where the wage earners live. To calculate income received by persons within a county, the BEA has developed residents adjustments. For example, in 1981 residents of other counties earned $28,784,000 more in Ontonagon than Ontonagon residents earned elsewhere (see Table 4). That figure constitutes more than 4 percent of total earnings generated in the county. Other counties exporting a large percentage of earnings or, correlatively, importing a large percentage of labor are Ingham, Washtenaw, and Midland. Although Wayne ranks fifth in the proportion of earnings going to outside residents, it has by far the largest sheer dollar volume.

In dollar volume of earnings imported or labor exported, Oakland is first and Macomb second, although in percentage ranking they are 39 and 24 respectively. These figures merely illustrate what is common knowledge—the dependence of Oakland and Macomb residents on Wayne County jobs is not inconsequential. In a relative sense, the greatest such dependence in this state is Eaton's reliance on Ingham.

## PROPERTY INCOME AND TRANSFER PAYMENTS

Total personal income is the sum of earnings received and income that entails no labor in return. The latter has two components: property income and transfer payments. Property income is received as dividends, interest, and rent by owners of capital. Transfer payments include Social Security and other pensions, welfare benefits, unemployment compensation, and other income not linked to current production or to capital ownership. Except for Huron, Keweenaw, and Mackinac, twenty Michigan counties that outrank the others in percentage of personal income derived from property ownership are all located in the northern Lower Peninsula (see Table 5). It is to these counties that many workers retire when they leave Genesee, Wayne, Macomb, and the other industrial centers.

### TABLE 4
### Earnings Residence Adjustment of Michigan Counties: 1981

(Dollar figures in thousands)

| County | Labor and proprietors' earnings by county in which earned | Residence adjustment | Labor and proprietors' earnings by county in which received | Proportion[a] |
|---|---|---|---|---|
| **Bottom Ten** | | | | |
| Eaton | 212,982 | 422,940 | 635,922 | 0.6651 |
| Clinton | 148,376 | 266,581 | 414,957 | 0.6424 |
| Livingston | 289,349 | 442,865 | 732,214 | 0.6048 |
| Leelanau | 32,407 | 33,291 | 65,698 | 0.5067 |
| Lapeer | 229,245 | 220,637 | 449,882 | 0.4904 |
| Keweenaw | 3,208 | 3,060 | 6,268 | 0.4882 |
| Cass | 163,810 | 151,654 | 315,464 | 0.4807 |
| Shiawassee | 256,153 | 223,628 | 479,781 | 0.4661 |
| Monroe | 557,195 | 457,125 | 1,014,320 | 0.4507 |
| Barry | 140,786 | 113,562 | 254,348 | 0.4465 |
| **Top Ten** | | | | |
| Otsego | 91,514 | −9,262 | 82,252 | −0.1012 |
| Genesee | 4,190,571 | −466,556 | 3,724,015 | −0.1113 |
| Wexford | 134,795 | −15,118 | 119,677 | −0.1122 |
| Grand Traverse | 411,989 | −49,243 | 362,746 | −0.1195 |
| Kent | 3,864,741 | −465,865 | 3,398,876 | −0.1205 |
| Wayne | 21,306,995 | −3,007,848 | 18,299,147 | −0.1412 |
| Midland | 686,693 | −111,530 | 575,163 | −0.1624 |
| Washtenaw | 2,835,392 | −635,540 | 2,199,852 | −0.2241 |
| Ingham | 3,122,133 | −897,921 | 2,224,212 | −0.2876 |
| Ontonagon | 68,941 | −28,784 | 40,157 | −0.4175 |
| Michigan | 68,820,300 | 471,756 | 69,292,056 | 0.0068 |
| United States | 1,645,325,008 | −484,000 | 1,644,841,008 | −0.0003 |

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

a. Residence adjustment as a percentage of labor and proprietors' earnings received (where positive) or generated (where negative).

During 1978, Social Security (federal, old age, survivors, and disability insurance) payments in Michigan accounted for 41 percent of total transfer payments; welfare, 15 percent; Medicare, 14 percent; military retirement and veterans' benefits, 4 percent; unemployment benefits, 11 percent; and other items, 15 percent. Lake County is more heavily dependent on transfer payments than any other Michigan county (see Table 6). It ranks first in welfare benefits as a percentage of personal income (6 percent), and fourth in Social Security benefits as a percenatge of personal income (19 percent). The rankings in Table 6 primarily reflect Social Security benefits, because they are the major component of transfer payments. Northern Michigan counties rank high in this table for the same reason that they are located at the top of the list in Table 5.

## PERSONAL INCOME

The sum of earnings received, property income, and transfer payments is a broad yardstick of the income available to individuals. Per capita personal income indicates how counties fare on the average in the acqusition of slices of national "pie." Oakland County does exceptionally well in this regard because it has high-paying industry and because well-paid workers with jobs elsewhere reside there (see Table 7). Michigan's other coun-

### TABLE 5
### Michigan Counties Most and Least Dependent on Property Income in Total Personal Income: 1981

| County | Percentage | Per capita |
|---|---|---|
| **Top Twenty** | | |
| Roscommon | 31.1 | $2,334 |
| Montmorency | 30.8 | 2,299 |
| Leelanau | 30.5 | 2,642 |
| Alcona | 27.8 | 1,959 |
| Antrim | 27.3 | 2,253 |
| Oscoda | 26.8 | 1,395 |
| Emmet | 26.0 | 2,367 |
| Huron | 25.3 | 2,369 |
| Benzie | 24.8 | 1,916 |
| Crawford | 24.4 | 1,659 |
| Sanilac | 22.9 | 1,889 |
| Keweenaw | 22.7 | 1,733 |
| Ogemaw | 22.1 | 1,491 |
| Missaukee | 21.8 | 1,376 |
| Grand Traverse | 21.3 | 2,164 |
| Lake | 21.2 | 1,391 |
| Houghton | 21.0 | 1,533 |
| Cheboygan | 20.9 | 1,613 |
| Mackinac | 20.7 | 1,770 |
| Presque Isle | 20.6 | 1,574 |
| **Bottom Twenty** | | |
| Van Buren | 15.3 | $1,296 |
| Jackson | 15.1 | 1,476 |
| Isabella | 15.1 | 1,157 |
| Montcalm | 14.9 | 1,297 |
| Ionia | 14.9 | 1,168 |
| Eaton | 14.8 | 1,426 |
| Livingston | 14.8 | 1,400 |
| Calhoun | 14.6 | 1,528 |
| Saginaw | 14.3 | 1,501 |
| Clinton | 14.2 | 1,400 |
| Macomb | 14.1 | 1,615 |
| Shiawassee | 14.0 | 1,343 |
| Muskegon | 14.0 | 1,279 |
| Ingham | 13.8 | 1,532 |
| Lapeer | 13.6 | 1,214 |
| Wayne | 13.3 | 1,533 |
| Monroe | 13.2 | 1,345 |
| Marquette | 13.2 | 1,156 |
| Luce | 13.2 | 1,272 |
| Genesee | 12.6 | 1,427 |
| Michigan | 15.6 | 1,682 |
| United States | 17.7 | 1,855 |

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

### TABLE 6
### Michigan Counties Most and Least Dependent on Transfer Payments in Total Personal Income: 1981

| County | Per capita | Percentage |
|---|---|---|
| **Top Twenty** | | |
| Lake | $2,462 | 37.5 |
| Montmorency | 2,712 | 36.3 |
| Keweenaw | 2,768 | 36.2 |
| Oscoda | 1,892 | 35.8 |
| Alcona | 2,465 | 35.0 |
| Roscommon | 2,593 | 34.6 |
| Ogemaw | 2,000 | 29.6 |
| Iron | 2,503 | 29.1 |
| Clare | 2,027 | 29.0 |
| Gogebic | 2,326 | 29.0 |
| Ontonagon | 1,936 | 27.1 |
| Chippewa | 2,040 | 27.0 |
| Baraga | 2,020 | 26.8 |
| Gladwin | 1,887 | 26.8 |
| Alger | 1,854 | 26.6 |
| Schoolcraft | 2,183 | 26.5 |
| Houghton | 1,913 | 26.2 |
| Arenac | 1,881 | 26.1 |
| Crawford | 1,761 | 25.9 |
| Cheboygan | 1,947 | 25.3 |
| **Bottom Twenty** | | |
| Barry | $1,165 | 14.7 |
| Saginaw | 1,533 | 14.6 |
| Lapeer | 1,292 | 14.5 |
| Allegan | 1,175 | 14.3 |
| Bay | 1,437 | 14.3 |
| Jackson | 1,394 | 14.3 |
| Cass | 1,299 | 14.2 |
| Genesee | 1,553 | 13.8 |
| Ingham | 1,431 | 12.9 |
| Kent | 1,335 | 12.6 |
| Monroe | 1,253 | 12.3 |
| Kalamazoo | 1,306 | 12.0 |
| Washtenaw | 1,268 | 11.1 |
| Ottawa | 1,053 | 10.9 |
| Clinton | 1,070 | 10.9 |
| Macomb | 1,226 | 10.7 |
| Eaton | 1,033 | 10.7 |
| Midland | 1,060 | 9.9 |
| Livingston | 909 | 9.6 |
| Oakland | 1,305 | 9.2 |
| Michigan | 1,548 | 14.4 |
| United States | 1,467 | 14.0 |

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

ties with heavy dependence on manufacturing also rank high in per capita income because the majority of those jobs are high paying.

Most northern Michigan counties in the Lower Peninsula have low per capita incomes because a high proportion of their residents are retirees living on accumulated wealth and pensions. Also, the retail and service industries that cater to them and to summer visitors offer low-paying jobs for the most part. The area provides summer employment for high school and college students as well as for older workers who live there. A survey of the economic attitudes of residents would likely find that those in Roscommon, Benzie, Antrim, Leelanau, and Emmet counties consider themselves well off, even though their per capita incomes are well below Michigan and national averages. In contrast, according to the most recent Census of Population (1980, based on 1979 incomes), the incidence of poverty among permanent residents was a ratio of 1:7 or more in Oscoda, Missaukee, Lake, Ogemaw, Clare, Alcona, Gladwin, Arenac, Kalkaska, Montmorency, Chippewa, Presque Isle, and Cheboygan. Among metropolitan counties, Wayne was the only one experiencing poverty at that level.

## TABLE 7
### Ranking of Michigan Counties According to Per Capita Personal Income: 1981

| County | Per capita personal income | Percentage change 1980–81 |
|---|---|---|
| Oakland | $14,126 | 8.7 |
| Wayne | 11,486 | 7.2 |
| Washtenaw | 11,462 | 8.8 |
| Macomb | 11,430 | 4.4 |
| Genesee | 11,296 | 11.5 |
| Ingham | 11,062 | 11.3 |
| Kalamazoo | 10,852 | 9.4 |
| Midland | 10,750 | 10.3 |
| Kent | 10,586 | 9.9 |
| Calhoun | 10,497 | 9.5 |
| Saginaw | 10,485 | 9.7 |
| Monroe | 10,163 | 12.6 |
| Grand Traverse | 10,160 | 9.7 |
| Bay | 10,048 | 11.6 |
| Clinton | 9,850 | 7.7 |
| Dickinson | 9,763 | 6.4 |
| Jackson | 9,758 | 10.5 |
| Luce | 9,698 | 11.5 |
| Ottawa | 9,655 | 8.9 |
| Eaton | 9,638 | 10.4 |
| Shiawassee | 9,574 | 8.4 |
| Lenawee | 9,525 | 8.6 |
| Berrien | 9,501 | 11.3 |
| St. Clair | 9,481 | 12.0 |
| Livingston | 9,464 | 8.3 |
| Huron | 9,356 | 8.5 |
| Cass | 9,174 | 8.6 |
| Gratiot | 9,147 | 5.6 |
| Muskegon | 9,123 | 8.8 |
| Emmet | $9,099 | 8.3 |
| Tuscola | 9,007 | 7.8 |
| Lapeer | 8,892 | 9.5 |
| St. Joseph | 8,869 | 7.5 |
| Branch | 8,844 | 8.1 |
| Marquette | 8,752 | 11.0 |
| Otsego | 8,723 | 9.5 |
| Montcalm | 8,686 | 9.8 |
| Leelanau | 8,660 | 9.2 |
| Charlevoix | 8,636 | 10.6 |
| Iron | 8,601 | 11.0 |
| Mackinac | 8,507 | 14.9 |
| Hillsdale | 8,479 | 14.2 |
| Van Buren | 8,462 | 10.5 |
| Alpena | 8,450 | 6.4 |
| Manistee | 8,369 | 11.3 |
| Delta | 8,357 | 12.6 |
| Sanilac | 8,237 | 11.0 |
| Antrim | 8,232 | 8.0 |
| Schoolcraft | 8,230 | 14.5 |
| Allegan | 8,205 | 10.8 |
| Menominee | 8,060 | 10.3 |
| Gogebic | 8,022 | 10.1 |
| Iosco | 7,968 | 10.9 |
| Barry | 7,913 | 6.1 |
| Ionia | 7,837 | 8.7 |
| Wexford | 7,768 | 9.6 |
| Benzie | 7,740 | 11.5 |
| Cheboygan | 7,717 | 8.0 |
| Isabella | $7,687 | 17.5 |
| Keweenaw | 7,657 | 11.9 |
| Presque Isle | 7,646 | 14.7 |
| Baraga | 7,568 | 8.1 |
| Chippewa | 7,562 | 16.4 |
| Roscommon | 7,514 | 10.3 |
| Mason | 7,505 | 7.5 |
| Montmorency | 7,500 | 9.7 |
| Kalkaska | 7,369 | 18.1 |
| Houghton | 7,301 | 11.6 |
| Arenac | 7,226 | 10.4 |
| Newaygo | 7,206 | 10.7 |
| Oceana | 7,170 | 8.0 |
| Ontonagon | 7,131 | 11.4 |
| Gladwin | 7,037 | 9.6 |
| Alcona | 7,025 | 12.7 |
| Clare | 6,998 | 9.7 |
| Alger | 6,934 | 12.3 |
| Osceola | 6,873 | 10.4 |
| Crawford | 6,798 | 12.0 |
| Ogemaw | 6,756 | 12.4 |
| Lake | 6,529 | 13.1 |
| Missaukee | 6,309 | 8.1 |
| Mecosta | 5,929 | 4.7 |
| Oscoda | 5,183 | 7.6 |
| Michigan | 10,758 | 8.6 |
| United States | 10,495 | 10.7 |

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

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# Quarterly Personal Income in Michigan

| | Millions of dollars, annual rates, seasonally adjusted | | | | | | | | Percentage change 82(3) to 82(4) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | | | | 1982 | | | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | Michigan | United States |
| **TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK** | | | | | | | | | | |
| **BY TYPE** | | | | | | | | | | |
| Wage and salary disbursements | 59,707 | 60,995 | 61,504 | 60,086 | 58,747 | 59,360 | 59,342 | 57,666 | − 2.8 | 0.3 |
| Other labor income | 7,496 | 7,789 | 7,943 | 7,798 | 7,720 | 8,011 | 8,040 | 7,682 | − 4.5 | 1.5 |
| Proprietors' income | 4,363 | 4,360 | 4,395 | 4,299 | 4,104 | 4,110 | 4,186 | 4,559 | 8.9 | 9.1 |
| Farm | 423 | 445 | 537 | 489 | 333 | 310 | 276 | 492 | 78.3 | 46.7 |
| Nonfarm | 3,940 | 3,915 | 3,857 | 3,810 | 3,772 | 3,800 | 3,910 | 4,067 | 4.0 | 3.2 |
| **BY INDUSTRY** | | | | | | | | | | |
| Farm | 679 | 700 | 788 | 739 | 588 | 571 | 542 | 763 | 40.7 | 27.0 |
| Nonfarm | 70,887 | 72,444 | 73,054 | 71,444 | 69,984 | 70,910 | 71,026 | 69,145 | − 2.6 | 0.5 |
| Private | 61,158 | 62,674 | 63,241 | 61,536 | 60,128 | 60,847 | 60,858 | 58,524 | − 3.8 | 0.3 |
| Ag. Serv., For., Fish., and other | 170 | 168 | 168 | 172 | 172 | 172 | 177 | 185 | 4.5 | 4.6 |
| Mining | 379 | 412 | 450 | 429 | 403 | 331 | 326 | 316 | − 3.1 | − 4.1 |
| Construction | 3,146 | 3,104 | 2,982 | 2,901 | 2,829 | 2,600 | 2,763 | 2,882 | 4.3 | 1.3 |
| Manufacturing | 29,037 | 29,952 | 30,167 | 28,341 | 27,448 | 28,725 | 28,108 | 25,312 | − 9.9 | − 1.8 |
| Nondurable goods | 4,645 | 4,820 | 4,822 | 4,735 | 4,823 | 4,979 | 4,965 | 4,783 | − 3.7 | 0.8 |
| Durable goods | 24,392 | 25,132 | 25,346 | 23,606 | 22,626 | 23,746 | 23,143 | 20,529 | −11.3 | − 3.4 |
| Transportation and public utilities | 4,060 | 4,192 | 4,264 | 4,239 | 4,254 | 4,149 | 4,100 | 4,074 | − 0.6 | 0.6 |
| Wholesale trade | 3,805 | 3,890 | 3,969 | 3,912 | 3,851 | 3,772 | 3,799 | 3,792 | − 0.2 | − 0.3 |
| Retail trade | 6,278 | 6,354 | 6,480 | 6,390 | 6,246 | 6,128 | 6,290 | 6,324 | 0.5 | 0.3 |
| Finance, insurance, and real estate | 2,854 | 2,942 | 2,987 | 3,071 | 2,851 | 2,908 | 2,991 | 3,106 | 3.8 | 3.4 |
| Services | 11,429 | 11,660 | 11,773 | 12,081 | 12,074 | 12,062 | 12,305 | 12,533 | 1.8 | 2.0 |
| Government and government enterprise | 9,729 | 9,770 | 9,812 | 9,908 | 9,856 | 10,063 | 10,168 | 10,621 | 4.5 | 2.0 |
| Federal, civilian | 1,236 | 1,236 | 1,260 | 1,287 | 1,263 | 1,306 | 1,334 | 1,345 | 0.8 | 1.6 |
| Federal, military | 227 | 230 | 235 | 267 | 262 | 264 | 268 | 274 | 2.2 | 3.7 |
| State and local | 8,265 | 8,305 | 8,317 | 8,355 | 8,331 | 8,494 | 8,567 | 9,002 | 5.1 | 1.7 |
| **DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE** | | | | | | | | | | |
| Total labor and proprietors' income by place of work | 71,566 | 73,143 | 73,842 | 72,183 | 70,572 | 71,481 | 71,568 | 69,908 | − 2.3 | 0.9 |
| Less: Personal contributions for social insurance by place of work | 3,801 | 3,891 | 3,927 | 3,834 | 3,845 | 3,867 | 3,864 | 3,703 | − 4.2 | — |
| Net labor and proprietors' income by place of work | 67,765 | 69,252 | 69,915 | 68,349 | 66,727 | 67,614 | 67,704 | 66,205 | − 2.2 | 1.0 |
| Plus: Residence adjustment | 463 | 468 | 478 | 479 | 481 | 481 | 486 | 485 | − 0.2 | — |
| Net labor and proprietors' income by place of residence | 68,228 | 69,720 | 70,392 | 68,827 | 67,209 | 68,095 | 68,190 | 66,689 | − 2.2 | 0.4 |
| Plus: Dividends, interest, and rent | 14,386 | 15,114 | 15,963 | 16,458 | 16,809 | 17,287 | 17,560 | 17,580 | 0.1 | — |
| Plus: Transfer payments | 13,952 | 14,015 | 14,294 | 14,717 | 14,772 | 15,604 | 15,754 | 17,125 | 8.7 | 4.4 |
| State U.I. benefits | 1,069 | 1,244 | 1,041 | 1,497 | 1,471 | 2,063 | 1,673 | 2,627 | 57.0 | 25.7 |
| Transfers excluding state U.I. | 12,883 | 12,770 | 13,252 | 13,220 | 13,301 | 13,542 | 14,081 | 14,498 | 2.9 | 2.9 |
| Personal income by place of residence | 96,567 | 98,849 | 100,649 | 100,002 | 98,790 | 100,987 | 101,504 | 101,393 | − 0.1 | 1.3 |

SOURCE: Bureau of Economic Analysis, special release.

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# General Population Trends and Issues in Michigan

by CHING-LI WANG *and* LAURENCE S. ROSEN, *demographers, Legislative and Local Policy Division, Michigan Department of Management and Budget*

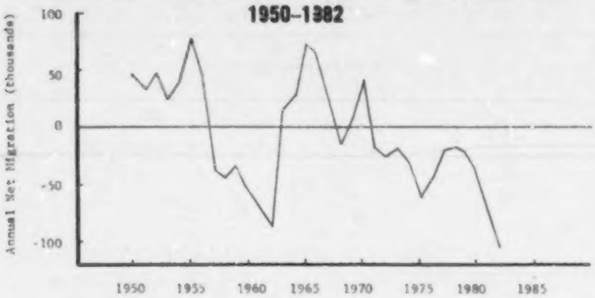
As the recession begins to diminish throughout the nation, and to some degree in Michigan as well, the process of gauging the impacts of the recession on current and future trends once again grows in importance. In Michigan it is particularly important for decision- and policymakers in both the private and public sectors to understand the changing demographic landscape, because growing signs of a strong economic recovery are not being accompanied by similarly strong signs relating to population growth throughout the state.

We last looked at the demographic trends in Michigan as revealed by preliminary counts from the 1980 Census of Population and Housing. Now, following two years in which we have been able to examine more extensive census data and have engaged in estimating postcensus population trends and predicting future population trends, the following comments constitute a more extensive and comprehensive follow-up to our previous article in *The Michigan State Economic Record.*

## GROWTH TRENDS AND MIGRATION

As the nation more fully enters the so-called "postindustrial age" and manufacturing is becoming less important in the nation's economy, Michigan is in the process of a great transition. Although Michigan's population increased by 4.3 percent from 8,881,826 in 1970 to 9,262,078 in 1980, the rate was less than one-third the rate of growth experienced in Michigan between 1960 and 1970. Since 1980, population growth has declined even more due to the recession, and for the first time since World War II, Michigan experienced significant population decline to 9,227,000 in 1982. As a result, the proportion of the total U.S. population residing in Michigan has dropped from 4.37 percent in 1970 to 4.09 percent in 1980 and 3.99 percent in 1982. In effect, the momentum of population growth experienced for decades in Michigan has slowed considerably, and that portion of Michigan's growth coming from migration into the state has disappeared entirely as migration out of Michigan has exceeded migration into Michigan for more than a decade. During the 1970s, Michigan had a net loss of 300,000 residents to other states. In a little over two years following the 1980 census, net out-migration from Michigan is estimated to have reached 184,000.

Michigan has had a long history of gaining migrants from other states and from abroad. During the first half of the twentieth century, Michigan's population grew by 4 million, and more than half of the increase (55 percent) was due to migration into Michigan of mainly younger people looking for (and finding) work. In the late 1950s, due to saturation within the motor vehicle market and the general recession, the level of employment in Michigan dropped by 300,000 and unemployment reached 418,000 in 1958. At the same time, Michigan experienced net out-migration of 322,000 between 1956 and 1962 which was more than what Michigan experienced between 1970 and 1980. But as Michigan recovered from the recession, net migration into Michigan resumed, at least for a while. Since 1968, Michigan has recorded a net loss through migration to other states in every year except 1970. As a result, Michigan gained only 32,000 new residents through migration



**Annual Net Migration of Population in Michigan, 1950–1982**

during the 1960s despite a strong economy during much of the decade. Population growth of one million people in Michigan between 1960 and 1970, in fact, was almost exclusively due to natural increase (excess of births to deaths). These changes to Michigan's typical pattern of growth through in-migration, however, simply did not become obvious until the 1970s when a net loss of 300,000 through out-migration was recorded.

Out-migration in excess of in-migration, however, is not unique to Michigan. Rather, it is part of a nationwide trend of population shifting from northeastern and north central states to the South and the West. Between 1975 and 1980, the Northeast lost 1.8 million people above the age of five to other parts of the nation; in the north central region, where Michigan is located, 1.5 million were lost to the South and the West. In contrast, the South gained two million people and the West gained 1.2 million during the same five-year period. During this time Michigan lost 256,000 residents to the South and West through migration, with Florida, California, Texas, and Arizona being the major destinations. The high level of migration out of Michigan since 1980, we believe, is also headed in much the same direction. Continuing high rates of out-migration, however, are *not* expected to continue into the future due to several factors, including diminished levels of employment opportunities elsewhere, lower wage scales elsewhere, and high rates of home ownership in Michigan. Nonetheless, continued net out-migration from Michigan during the next several years will still contribute to relatively slow rates of population growth in this state.

## BIRTHS AND DEATHS

Another factor contributing to Michigan's slow rate of population growth is the decline in fertility during the past decade. If the fertility rates in the 1970s were the same as in the 1960s, Michigan would have recorded about 2 million births in that 10-year period rather than the 1.4 million births which actually occurred; and population growth in Michigan would have been 11 percent instead of 4.3 percent. Simiarly, had fertility rates remained at their earlier and higher levels, Michigan would have grown by 60,000 between 1980 and 1982 instead of having a 35,000 population loss.

Today, Michigan women are having an average of less than two children each, and this rate of total fertility is expected to continue in the near future. Young women aged eighteen through twenty-four in 1981 reported just over two children as their lifetime birth expectation, virtually unchanged since 1976. Since lower fertility rates have been recorded among employed women and since the number and proportion of childless married women are both increasing, births in Michigan will not increase substantially, even if many of those who have delayed childbearing decide to fulfill their childbearing expectations.

Mortality in Michigan has declined dramatically during the past decade. Life expectancy at birth in Michigan increased from 70.8 years in 1970 to 73.4 years in 1980. This increase of 2.6 years is significantly greater than during the 1960s when life expectancy grew by less than a year. Infant mortality (which is widely recognized as one of the better indicators of a population's general health and welfare) declined from 20.3 deaths per one thousand live births in 1970 to 12.8 deaths per thousand in 1980.[1]

Since 1970 deaths in Michigan have declined fairly regularly. At the present time annual deaths in Michigan are less than eighty thousand. As the health status of the population improves and as advances in medical technology continue, mortality rates in Michigan will continue to decline, and average life expectancy is likely to surpass seventy-five years by the early 1990s. Despite this, the actual number of deaths occurring each year in Michigan is likely to grow slightly during the 1980s as the population ages and as the elderly become a larger proportion of the total.

## AGE COMPOSITION

Migration, births, and deaths not only determine population growth but they also affect the age composition of the population. During the fullest development of the automobile industry in Michigan between 1910 and the mid-1950s, large numbers of young workers from Appalachia, the Deep South, and Europe streamed to Michigan in search of work and higher wages. In more recent years, older Michiganians began to leave the state to retire in warmer and sunnier climates. As a result, Michigan's population has been somewhat younger than that of the nation for several decades. Today, Michigan's growing minority popuation—which is substantially younger than the nonminority population and which continues to exhibit higher than average fertility rates—is helping to keep Michigan's population relatively young. Even after a decade of losing young people to the South and the West through out-migration, Michigan's population in 1980 was still more than a year younger than the national average (28.8 versus 30 years).

Despite this younger than average population, Michigan is following the nationwide trend toward growing older. The aging of Michigan's population, however, is no simple matter. Rather, it is due to three very significant underlying trends. First is a dramatic reversal from explosive growth in the youth population through the 1950s and 1960s to precipitous decline in that same population during the 1970s and 1980s. Second, the baby-boom generation itself is growing up and growing older. And finally, people are living longer, and Michigan's older population is growing faster than the population at large.

During the baby-boom period of the late 1940s, the 1950s and the early 1960s, Michigan and the nation experienced dramatic increases in the number of children. The population under five years of age in Michigan increased sharply—by 63 percent between 1940 and 1950 and by 38 percent between 1950 and 1960. The school-aged population (ages five through seventeen), which only increased by 11 percent during the 1940s, jumped by 53 percent in the 1950s and continued to increase during the 1960s. In actual numbers Michigan experienced an increase of more than a million in the school-aged population between 1950 and 1970. Teacher shortages and crowded classrooms were typical during this time period as a result.

Since then, however, the dramatic reduction in births after 1970 has resulted in a substantial decline in the population below age eighteen. Between 1970 and 1980 Michigan's population under eighteen decreased by 503,000, a 15 percent reduction. Youths as a proportion of Michigan's population consequently have dropped from 36.5 percent in 1970 to less than 30 percent in 1980. An oversupply of teachers and empty classrooms have become a prevailing problem across the state and the nation as a result.

As the baby-boom population is now squarely within its prime child-bearing ages, the number of births in Michigan may be expected to increase throughout the rest of the 1980s. As fertility levels have remained quite low in recent years and as survey data reveal no perceptible change regarding the number of children women currently want or intend to have, the increase will be due entirely to the large growth in the number of women of child-bearing age—many of whom will actually become mothers. Continued out-migration of young adults from Michigan, however, may be expected to dampen the growth in births during the 1980s somewhat. During the 1990s, barring any changes in actual or desired levels of fertility during the next decade, births may again decline somewhat as the current generation of mothers reaches the end of their productive years.

In contrast to recent declines in the younger population, those aged eighteen through forty-four increased by 22 percent between 1970 and 1980. Again, this increase is due largely to the aging of the baby-boom generation. The proportion of the population eighteen to forty-four increased from 35 percent in 1970 to 41 percent in 1980 and 42 percent in 1982. Throughout the 1970s this growth has been characterized by large numbers of people born during the baby boom reaching eighteen and, in many cases, entering the labor market. Since those entering the labor force for the first time today are from the tail end of the baby boom, those in the age range of eighteen to forty-four will decline by the late 1980s and early 1990s. After 1990, as those who are now eighteen to forty-four begin to enter middle age, they will be replaced by those born later, including their children, who comprise smaller cohorts. As the population eighteen to forty-four shrinks, however, there will be a tremendous increase in the middle-aged population, those between the ages of forty-five and sixty-four. This group grew slightly during the 1970s and experienced a small decline between 1980 and 1982. We believe that this age group will continue to decline during the 1980s as it is increasingly composed of the relatively small cohorts born during the depression and the early years of World War II. Later, during the 1990s, this age group will once again grow as the baby-boom generation begins to enter middle age.

As life expectancy increases, Michigan's older population will continue to increase at a rate faster than any other age group. Between 1970 and 1980, Michigan's population aged sixty-five and over increased by 22 percent. The proportion of Michigan's total population which is above age sixty-five also increased from 8.4 percent in 1970 to 9.8 percent in 1980. Older people will likely comprise 13 percent of the state's population by the year 2000 and perhaps as much as 22 percent by 2050.

Regardless of the specific numbers, the aging of Michigan's population will significantly alter the dependency ratio in this state in two ways. First, while the dependent population has been primarily a young population in the past, the dependent population is becoming old even faster than the general population. Secondly, the ratio of the working-age population (those eighteen to sixty-four years of age) to those who are older is declining and will continue to decline during the foreseeable future. In 1980 there were 5.4 people of working age in Michigan to every person age sixty-five or more. By 2000, this ratio may decline to 4.7 or fewer working age people for every elderly person.

## GEOGRAPHIC DISTRIBUTION

Although slow population growth in Michigan during the past decade is mainly due to out-migration, these losses have not been uniform across the state. Losses in population through out-migration in recent years have been mostly from metropolitan areas, especially Michigan's larger cities. During the 1970s, Michigan's metropolitan areas (1981 definition) experienced a net loss of 422,300 people through out-migration. Counties which contain central cities lost more than a half million people through migration during during that period. Among Michigan's largest cities, Detroit, Grand Rapids, Flint, Warren, Lansing, Livonia, Dearborn, Westland, Kalamazoo, Saginaw, Pontiac, Bay City, and Muskegon all lost population.

In contrast, metropolitan fringe counties experienced substantial growth between 1970 and 1980. Newly developing suburban centers such as Sterling Heights, Troy, Southfield, and other fringe communities recorded substantial growth during the 1970s. However, the growth of metropolitan fringe areas during the 1970s was far less spectacular than during the 1960s as population deconcentration has moved beyond the suburbs.

While metropolitan areas and major cities were losing population during the 1970s, the nonmetropolitan and rural areas of Michigan were gaining population. The revival of population growth in rural areas was so great that this became the single most significant development

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# Michigan Economic Indicators

| Item | Year previous of latest month | Previous month | Latest month |
|---|---|---|---|
| Manufacturing workers: | | | |
| Average weekly hours, Michigan | 4[illegible].6 | 42.5 | 42.0 (July) |
| Average weekly hours, U.S. | 38.9 | 40.4 | 40.1 (July) |
| Average hourly earnings, Michigan ($) | 11.35 | 11.64 | 11.66 (July) |
| Average hourly earnings, U.S. ($) | 8.55 | 8.81 | 8.86 (July) |
| U.S. motor vehicle production (units) | 609,230 | 885,550 | 616,242 (July) |
| Electricity usage (mil. kwh.): | | | |
| Michigan | 5,389 | 5,656 | 5,400 (Apr.) |
| United States | 164,412 | 173,959 | 163,865 (Apr.) |
| Raw steel production: | | | |
| Michigan (000 net tons) | 597 | 588 | 620 (July) |
| United States (000 net tons) | 5,719 | 6,993 | 6,921 (July) |
| Consumer price index (1967 = 100) | | | |
| Detroit area | 292.2 | 296.6 | 298.4 (July) |
| United States | 292.4 | 298.1 | 299.3 (July) |
| U.S. producer price index (1967 = 100) | 300.4 | 302.5 | 303.2 (July) |
| Michigan farm prices received index (1977 = 100) | 137 | 134 | 131 (July) |

SOURCE: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Ward's Automotive Reports; American Iron and Steel Institute; and Energy Information Administration.

# Permit Authorized Construction in Selected Counties, First 6 Months 1982 and 1983

(Thousands of Dollars)

| County | Residential | | | Nonresidential | | | Office | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1982 | 1983 | Percentage change | 1982 | 1983 | Percentage change | 1982 | 1983 | Percentage change |
| Allegan | 1,217 | 2,617 | 115 | 20 | 41 | 105 | 0 | 0 | 0 |
| Antrim | 1,646 | 3,408 | 107 | 110 | 0 | −100 | 0 | 0 | 0 |
| Berrien | 2,857 | 2,662 | − 7 | 1,216 | 36 | − 97 | 2,108 | 0 | −100 |
| Clinton | 2,009 | 3,239 | 61 | 12 | 0 | −100 | 0 | 0 | 0 |
| Emmet | 3,103 | 2,309 | − 26 | 0 | 0 | 0 | 0 | 0 | 0 |
| Genesee | 7,860 | 11,326 | 44 | 20 | 920 | 4,500 | 2,195 | 3,180 | 45 |
| Grand Traverse | 4,912 | 9,180 | 87 | 130 | 32 | 75 | 638 | 664 | 4 |
| Ingham | 8,532 | 14,280 | 67 | 62 | 340 | 448 | 1,987 | 340 | − 83 |
| Jackson | 3,945 | 2,380 | − 40 | 46 | 0 | −100 | 31 | 0 | −100 |
| Kalamazoo | 7,857 | 9,536 | 21 | 1,324 | 2,794 | 111 | 878 | 735 | − 16 |
| Kent | 17,405 | 42,362 | 143 | 9,884 | 4,129 | − 58 | 3,583 | 1,589 | − 56 |
| Livingston | 3,656 | 7,266 | 99 | 1,027 | 0 | −100 | 451 | 250 | − 45 |
| Macomb | 18,004 | 41,178 | 129 | 585 | 3,572 | 510 | 2,120 | 2,247 | 6 |
| Midland | 1,908 | 7,207 | 278 | 0 | 405 | 100 | 0 | 205 | 100 |
| Muskegon | 2,248 | 3,712 | 65 | 182 | 200 | 10 | 131 | 373 | 185 |
| Oakland | 24,851 | 108,569 | 337 | 5,164 | 5,246 | 2 | 12,371 | 52,581 | 325 |
| Ottawa | 7,058 | 18,224 | 158 | 1,056 | 1,106 | 5 | 80 | 315 | 294 |
| Saginaw | 1,185 | 2,819 | 138 | 60 | 180 | 200 | 347 | 651 | 87 |
| St. Clair | 2,469 | 5,786 | 134 | 682 | 91 | − 87 | 145 | 1,488 | 926 |
| Washtenaw | 7,433 | 12,673 | 71 | 2,095 | 6,720 | 221 | 5,925 | 9,277 | 57 |
| Wayne | 9,950 | 48,179 | 384 | 155,309 | 20,201 | − 87 | 7,203 | 2,673 | 63 |
| Michigan | 207,617 | 452,525 | 118 | 181,047 | 57,192 | − 68 | 42,753 | 81,906 | 92 |

SOURCE: Bureau of the Census, special release.

of population change during the 1970s. The magnitude of this change becomes evident when growth trends of the 1960s and 1970s are compared. Metropolitan areas which increased by 928,000 persons during the 1960s only gained 146,000 during the 1970s, an 85 percent reduction in the amount of population growth. In contrast, nonmetropolitan areas which increased by 130,000 persons between 1960 and 1970, gained 234,000 new residents between 1970 and 1980, an 80 percent increase in population growth.

The so-called "rural revival," however, has not occurred uniformly throughout Michigan's nonmetropolitan areas, and cities in rural areas have not gained many new residents as the result of it. Instead, surrounding areas—both those adjacent as well as those further away from nonmetropolitan towns and cities—have been the areas where population gains have been the strongest. In fact, small cities and villages in Michigan's rural areas lost about 1 percent of their population between 1970 and 1980. That means many of those small places experienced out-migration during the 1970s. In contrast, rural parts of nonmetropolitan areas recorded a 21 percent gain in population during this period, and this was due to substantial in-migration.

Among Michigan's nonmetropolitan counties, those located in the southern Lower Peninsula—mainly those which are adjacent to metropolitan areas—experienced moderate population growth during the 1970s. Growth in these counties during the 1970s was 38 percent greater than the gain recorded during the 1960s. Net migration into these counties jumped from 8,500 in the 1960s to 50,600 in the 1970s.

Counties located in the northern Lower Peninsula experienced even more rapid growth. Population growth north of a line from Bay City to Muskegon during the 1970s was double the rate of growth during the prior decade. The net migration rate increased from 7.8 percent in the 1960s to 23.4 percent in the 1970s, and net migration accounted for 80 percent of all population growth in this area during the 1970s.

After fifty years of population decline, population growth was once again observed in the Upper Peninsula. Between 1970 and 1980 the UP gained more than 15,000 residents including the net migration of more than 800 people, thus reversing a long-standing trend of out-migration from this region.

Despite these developments, the rural revival in Michigan was disturbed between 1980 and 1982. Nonmetropolitan portions of southern lower Michigan recorded net out-migration in both 1981 and 1982. Northern lower Michigan experienced a substantial reduction of net in-migration in 1981 and virtually no growth through migration in 1982. And the Upper Peninsula again saw an excess of out-migration over in-migration during this period. Undoubtedly, these findings reflect in part the impact that the recession has had on the mobility of the population. Moreover, high interest rates and fewer job opportunities eventually reduced the ability for many people to move. On the other hand, since the rural revival of the 1970s reflected a general tendency of the population to pursue an enhanced quality of life in less populated areas, we anticipate that the rural revival will reemerge as the economy recovers and people can once again afford to move.

Despite the rural revival, it is important to note that the greatest proportion of Michigan's population still lives in our several metropolitan areas--84 percent in 1970, 83 percent in 1980, and 82.5 percent in 1982. Although the proportion residing in metropolitan areas will continue to decrease, it is very unlikely that there will be more people living in rural areas than in urban areas at any time in the foreseeable future. In particular, southern lower Michigan—where all of Michigan's metropolitan areas are located and where more than 90 percent of all Michiganians live—will continue to be the most populous area in the state.

## HOUSEHOLD AND FAMILY CHARACTERISTICS

Despite the low rate of population growth in Michigan recently, the number of households increased 20 percent from 2,653,000 in 1970 to 3,195,000 in 1980. This was accompanied by a decline in the number of persons per household, from 3.27 to 2.84 during the ten-year period.

The number of people living alone or with other unrelated persons has increased steadily since World War II. The big increase occurred during the 1970s—a 70 percent increase from 470,300 households in 1970 to 802,700 in 1980. Nonfamily households as a proportion of all households increased from 17.7 percent in 1970 to 25 percent in 1980. This has been the largest increase in history.

Family households, in contrast, are down from 82 percent of all households in 1970 to 75 percent in 1980, even though the number of families in Michigan increased from 2.2 million to 2.4 million during this period. However, family size became smaller, decreasing from 3.7 persons per family in 1970 to 3.3 in 1980. Husband-wife families were down from 72 percent of all households in 1970 to only 61 percent in 1980. Another big change is the drastic increase in one-parent families. Households headed by women with no husband present increased by 70 percent during the 1970s. Children under eighteen in one-parent families also increased substantially. Ten years ago, one in every ten children under eighteen lived in one-parent families; today, one in every five children live in this type of family.

The changing composition of households and families in recent years indicates a great transition in American attitudes toward family, marriage, and living arrangements. These changes are associated with growing divorce rates (from 3.4 divorces per 1,000 Michigan residents in 1970 to 4.4 in 1980), and the growth in nonfamily households in part reflects substantial growth in the elderly population—particularly elderly people living alone. There has also been increased acceptance of people of the opposite sex sharing living quarters.

## CHANGING LABOR FORCE

Another significant transition of Michigan's population trends is closely tied to the changing American industrial structure. During the past two decades the relocation of substantial manufacturing industries and business from the North to southern and western states and overseas as well as the development and increasing use of automation in production processes has had serious impact on employment in Michigan. After reaching a peak of more than 400,000 automotive employees in Michigan in 1978 (and more than 1 million nationwide), employment in the auto industry declined sharply. Production line workers, laborers, machine operators, and various skilled crafts workers throughout all of Michigan's industries have declined by 92,000, down from 42 percent of the employed labor force in 1970 to only 34 percent in 1980. In contrast, the number of white-collar workers—those employed in managerial, professional, technical, sales, and administrative support (secretarial and clerical) positions—grew by more than 440,000, an increase of 30 percent. White collar workers accounted for 50.5 percent of the labor force in 1980 compared with 44.8 percent in 1970.

Despite structural changes, the 1980 census also revealed that Michigan continues to be a highly industrialized state in which 30 percent of the labor force is engaged in manufacturing. While this percentage is relatively high when compared to many other states, it also represents a significant decline from the 35.2 percent share recorded in 1970. In contrast, employment in wholesale and retail trade and in the service sector has risen. Employment in wholesale and retail trade increased from 19.4 percent in 1970 to 20.1 percent in 1980. Employment in services, including business services, personal services, entertainment, and the professions increased from 24.5 percent of total employment in 1970 to more than 28.4 percent in 1980.

Another important development is the increase in female labor force participation. In 1970, 40 percent of Michigan women aged sixteen and older were in the labor force (compared with 78 percent of men). In 1980, 49 percent of women were in the labor force (compared with 75 percent of men). An increasing number of women with children are also employed. Of 1.3 million women in Michigan with children under the age of eighteen, more than half were employed or were in the job market in 1980. Moreover, more than 40 percent of these women have children beow the age of six. Accompanying these changes are increases in the number of families with two or more wage earners (up 145,000, from 50 percent of all families in 1970 to 52.7 percent in 1980) and a decline in the number of families with only one wage earner (down 77,000, from 40.5 percent in 1980 to 33.9 percent of all families in 1980).

## IMPLICATIONS: SLOW POPULATION GROWTH

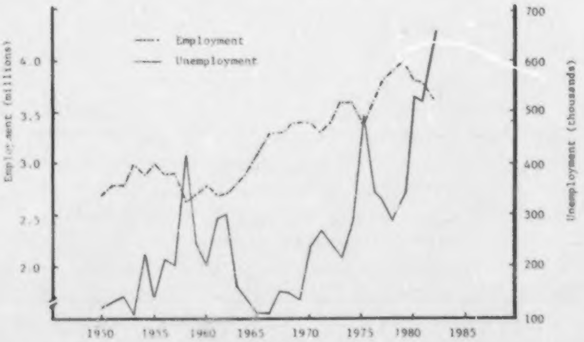
While it is quite clear that population growth in Michigan has slowed in recent years, the population losses suffered between 1980 and 1982 are not expected to continue as the nation recovers from the recession. As Michigan's recent population trends reflect a general population shift from northern states to the South and the West, relatively slow population growth may be expected in the future. Perhaps the most significant result of this will be losses in political influence. Michigan lost one congressional seat following the last census due to relatively sluggish growth compared to other states, and continued slow growth will almost certainly result in additional losses of congressional representation following the 1990 and 2000 censuses. In addition, as long as population is used as a factor in allocating funds to states and local units of government through revenue sharing and other formula grant programs, Michigan's share will continue to decline as the focus of growth moves elsewhere and Michigan slowly becomes a relatively smaller portion of the nation.

Slowing population growth may also be viewed as an opportunity for Michigan to enhance the quality of life and adequacy of services to the pubic because of diminishing demands and pressures from the population. However, the changing household and family composition of Michigan's population, as mentioned earlier, will undoubtedly create new demands for services of various sorts. Moreover, the aging of the population will result in a shifting of demands from one segment of the population to another. These shifts will also create new markets which will require new products and services—or at least a new mix of products and services—all of which will stimulate the economy in Michigan.

## IMPLICATIONS: EMPLOYMENT AND OUT-MIGRATION

In recent years, a large number of manufacturing industries originally located in the North have established or expanded their physical plants in the South or the West. As a result, manufacturing activities have grown at a considerably accelerated pace in these regions. Such differential growth along with increased automation throughout Michigan's industrial infrastructure point to continued diminishing industrial employment opportunities in Michigan.

**Employment and Unemployment in Michigan, 1950–1982**



These trends are not inevitable, however, despite the population and economic patterns of the past decade. Efforts to capitalize on Michigan's industrial strength are just beginning at this time. Reindustrialization through physical plant modernization, expansion of the products manufactured by Michigan's metal-forming industries, expansion of the paper and pulp industries and other agricultural processing activities, and establishment of the just-in-time production system for the automotive industry (such as the Buick City project in Flint) may serve to diminish the outflow from the state. The extent to

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which these approaches are implemented and the extent of their impact, however, remain to be seen.

## IMPLICATIONS: CHANGING AGE COMPOSITION

Low fertility rates, reduced rates of marriage, and delayed marriage and childbearing among those choosing to marry have all contributed to relatively low birth rates in Michigan in recent years. As these practices and trends are expected to continue, we anticipate low levels of fertility—with births numbering between 135,000 and 150,000 per year—for the rest of this century.

These trends have resulted in substantial drops in the number of children in Michigan and consequent declines in school enrollments. Total public and private school enrollments dropped from 2.46 million during the 1969–70 school year to 1.87 million in 1981–82, a decrease of 24 percent. To maintain original levels of faculty, staff, and services in the schools in face of declining enrollments will inevitably entail per student cost increases. Ancillary problems concerning the best uses of existing facilities and staff to serve the educational needs of the adult population are also emerging as a result of declining enrollments among children.

In contrast, both the number and the proportion of Michigan's population aged eighteen to forty-four are increasing despite tremendous out-migration in this age group to other states. The immediate impact is an increase in the childbearing age population and the maintenance of moderate levels of births despite sharp declines in fertility rates during the past decade.

This age group has exerted strong pressures on Michigan's colleges and universities in the past. Enrollments in institutions of higher education in Michigan increased without interruption until 1980–81 when enrollments reached a peak of 554,000. Since then, enrollments have begun to decrease as the tailend of the baby boom generation finishes college. This decrease in enrollments will probably continue for at least ten more years.

The most serious impact of the increase of younger adults in recent years has been the dramatic increase of new entrants to the labor force. Those currently aged eighteen to forty-four comprise a large potential labor pool, much of which is the product of the baby boom. As these unusually large birth cohorts have reached the age of employment, they have tended to experience unusually high rates of unemployment. This we believe has been due to the inability of Michigan's economy to expand quickly enough to absorb the increased labor supply. This phenomenon alone explains roughly half of the out-migration of those aged fifteen through twenty-nine during the 1970s and perhaps even more during the recent recession.

As the baby boom generation matures during the next two decades, it will be replaced by smaller cohorts born during more recent years. Because of this projected decline of new entrants to the labor force combined with the changing demands for goods and services generated by a maturing population, it is possible that we may actually experience labor shortages — probably in such areas as personal services as well as various technical business and repair services—as early as the mid-1990s.

For the older population (sixty-five and older), both numbers and proportions have been steadily increasing during the past decade, and they will continue to do so during the next several decades. By the year 2000—as the baby boom generation approaches retirement age—we anticipate a "senior boom." By then, one of every three or four adult Michiganians will be sixty-five or older. Many older people in Michigan, in fact, will live to be more than 80 years old. In other words, many older people will have another fifteen or twenty years to live after retiring at age sixty-five.

The immediate impact of this increase is a shift in Michigan's dependent population from young to old. The cost of social services for the aged will continue to increase and will place a growing financial burden on the working-age population. The current financial crisis within the Social Security system is a prime example of the sort of problems the states and smaller areas will have to face during the next decade or two.

In addition, the needs of older people are different from those of the young. As the older population continues to increase, the elderly will create new demands on the economy, on government, and on our various institutions and social systems. The key long-term impact of Michigan's changing age composition will be seen in the institutional adjustments made to better serve a growing older population: increased political influence among the elderly; growing recognition of the elderly market for goods and services of all sorts; and, most importantly, increasing concern with the productive utilization of the elderly population throughout the economy.

## IMPLICATIONS: POPULATION GROWTH IN RURAL AREAS

Rural areas in Michigan experienced substantial population growth during the 1970s. As a result, many rural cities and towns—communities which had become used to little or no growth or even declines in population—were now faced with redirecting their attention to the problems associated with population growth. These problems have mainly revolved around providing adequate public services such as fire and police protection, water and sewage, solid waste disposal, road maintenance, and snow removal. Furthermore, as much of the rural residential growth and industrial development has taken place adjacent to or even further away from Michigan's nonmetropolitan cities and towns, there is the danger that the problems which accompany such development may overwhelm the limited planning and governmental resources available in Michigan's more rural areas. The rural environment which first attracted new growth and development in the 1970s might be ruined in the 1980s unless adequate environmental safeguards are devised and maintained during the next several years.

Although the growth in rural areas was interrupted in the past two years, we believe that the movement from urban to rural areas will continue as the economy recovers and people can again afford to move. Problems

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associated with rural growth in the recent past will be magnified as this pattern of rural population growth is reestablished during the 1980s.

## SUMMARY

Michigan is in the process of a great transition. While the economy is becoming more diversified, the demographic character of this state is also changing. As manufacturing and other economic activities shifted from the North to the West and the South during the past several decades, Michigan experienced heightened levels of out-migration which only became evident to most people during the late 1970s and the early 1980s. Moreover, because of decreased demand for industrial workers in manufacturing jobs—jobs which constitute one-third of Michigan's work force—Michigan will continue to lose population through migration until the transition is completed at the level that a more diversified economy can absorb and attract new workers.

Along with this transition in the economy, the aging of the population as well as changing attitudes towards the family, marriage, and living arrangements have affected Michigan's demographic trends in recent years. Fertility has been at near record low levels for some time, and people tend to want fewer children and to delay child bearing. As a consequence, household and family size decreased substantially in the past decade. At the same time, people are living longer, The number and proportion of older people has been increasing substantially while the number of younger people has decreased dramatically in Michigan. As a result, a short supply in the labor force will be felt during the next two decades in contrast to the oversupply of labor we have had to cope with in recent years.

Finally, the rural revival has been felt strongly in Michigan, and despite a severe slowdown in the urban to rural movement brought on by the poor economy in recent years, the natural beauty, the recreational opportunities, and other amenities in Michigan will once again draw new residents, new businesses, and new industries during the next decade. Along with this growth will come the problems of population and economic growth which were thought to have been left behind.

## NOTE

1. The provisional infant mortality rate for the entire United States was 12.5 deaths per 1,000 live births in 1980; the provisional infant mortality rate for Detroit was 21.0 in 1980, according to figures provided by the Office of Vital and Health Statisics, Michigan Deparment of Health.

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